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THE ARCHITECTURAL RECORD

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AND take the swimming-pool, too, if you will. Not just because we've got a product to sell that's plastered all over the place, but because the job will give you some idea of how useful and helpful a material Atlas White portland cement really is.

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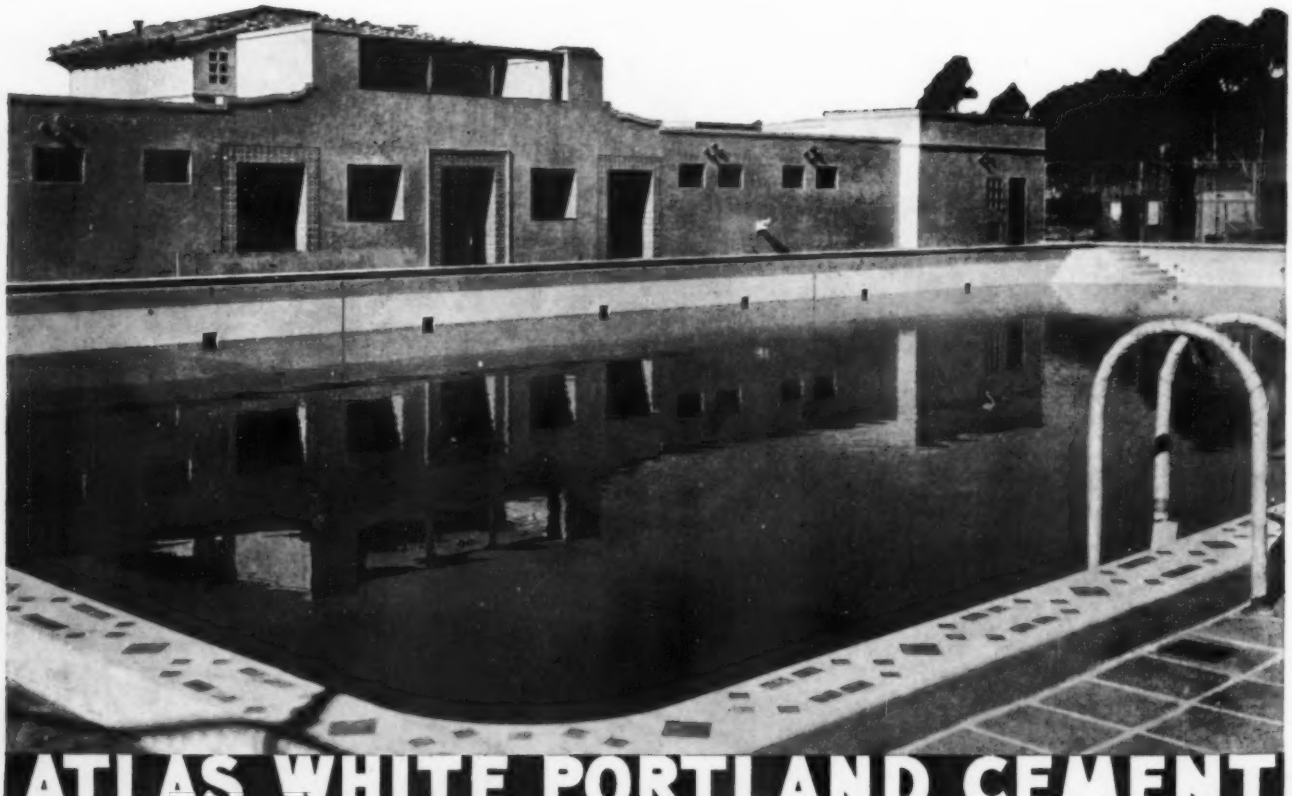

ATLAS WHITE PORTLAND CEMENT

Wurts

New Home Office Building of the Metropolitan Life Insurance Company

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THE ARCHITECTURAL RECORD

SEPTEMBER, 1933
VOLUME 74
NUMBER 3

CODE COMMITTEE OF THE CONSTRUCTION LEAGUE OF THE UNITED STATES. . . . . Frontispiece

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ARCHITECTS' ANNOUNCEMENTS

John F. Alter, architect, has opened an office for the practice of architecture at 602 Central Building, Lawrence, Massachusetts.

Fogliani and Dielman, architects, announce the opening of an office at 627 Hickox Building, Cleveland, Ohio.

J. Howard Hess, George H. Bugenhagen and Russell Deeter, architects, have opened an office at 208 First Avenue Building, Minot, North Dakota, under the firm name of Bugenhagen, Hess and Deeter.

Young and Reid, architects, announce the removal of their offices from 5, Verulam Building, Grays Inn, London, England, to 6, John Street, Bedford Row, London.

The new address of Donn Hougen, architect, is Room 18, Wood Block, Wisconsin Rapids, Wisconsin.

Robert C. Berlin, architect, has moved from 228 North La Salle Street to 19 South La Salle Street, Chicago, Illinois.

F. W. Whitehouse, architect, is now located at Room 230, 20 South 3rd Street, Columbus, Ohio.

A. Ray Willard, architect and structural engineer, has moved from 1320 Republic Bank Building to 1604 Kings Highway, Dallas, Texas.

The Architectural Exhibition, conducted annually by The Architectural League under the auspices of The American Institute of Architects, the Illinois Society of Architects and the Architectural Sketch Club of Chicago, has been moved from the Architect's Club, 1801 South Prairie Avenue, Chicago, Illinois, to the second floor of the General Exhibits Building at the Century of Progress.

CALENDAR OF EXHIBITIONS AND EVENTS

September	International Exposition of Modern Architecture and Modern Decorative and Industrial Art at Milan, Italy.
Sept. 6-21	Reunion of International Architects organized by L'Architecture D'Aujourd-hui. The group will spend September 7-12 at the Milan Exposition and the remaining days will feature a tour of Italy.
Until November 1	"A Century of Progress," International Exposition at Chicago.
Until June, 1934	Remodeling Competition conducted by the Good Housekeeping Studio, 57th Street and 8th Avenue, New York City.

Left: "Nervid Fountain"—Beatrice Fenton
Center: "The Sower"—Lee Lowrie
Right: "Nymph and Dolphin"—Carl Milles

Edward Quigley

EXHIBITION OF CONTEMPORARY SCULPTURE

Now being held in the courts and gardens of the Pennsylvania Museum of Art under the auspices of the Fairmount Park Art Association, the Pennsylvania Museum of Art, and the Philadelphia Art Alliance.

The exhibition has been arranged to enable the Committee on the Ellen Phillips Samuel Memorial to review the field of contemporary sculpture. Six artists will probably be chosen to work out the preliminary studies for the sculpture to be incorporated in the first unit of the memorial, which will consist of sculpture symbolizing the history of America. The central unit of this scheme of backgrounds, designed by Paul P. Cret, Philadelphia architect, has been completed.

The exhibition continues to September 15.

METROPOLITAN INSURANCE COMPANY BUILDING BIDS FOR PIPE SECURITY WITH TONCAN IRON

Architects: Waid & Corbett, New York City. Heating, Ventilating and Plumbing Engineer: Clyde R. Place, New York City. Plumbing Contractors W. G. Cornell, New York City.

The place that Toncan Iron Pipe has earned in the building industry is typified by its selection for use in the new Metropolitan Insurance Company Building, New York City. It is installed in the drainage, waste, vent and air conditioning lines. Sizes range up to 12-inch.

And so another paragraph is written into the chapter listing the famous new buildings for which Toncan Iron Pipe has been chosen on its proved merits.

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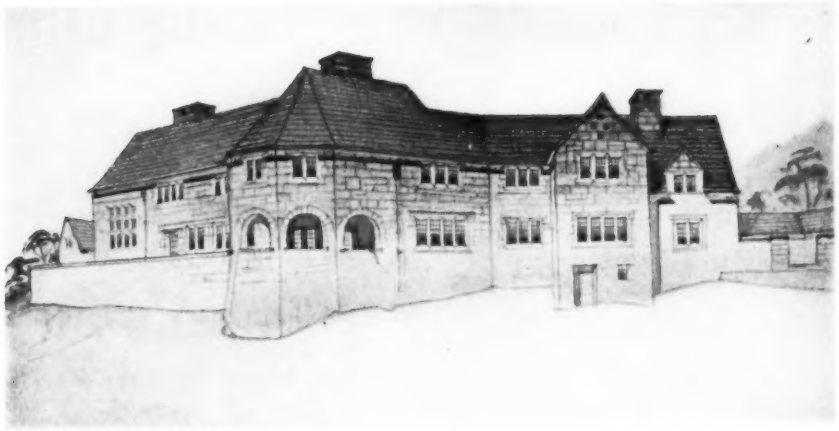


From Academy Architecture

A PERSPECTIVE DRAWING BY BRIANT A. POULTER, ARCHITECT

ACADEMY ARCHITECTURE AND ARCHITECTURAL REVIEW. Vol. 62, 1931. Edited by H. W. Martin-Kaye. B. T. Batsford, Ltd.: London. 224 pages. Over 260 illustrations. 10s net.

A glance at the list of contents arranged alphabetically under names shows the work of fourteen architects, among them such familiar practitioners as Sir Herbert Baker, A.R.A., architect of the Bank of England, and Sir John Burnet, Tait & Lorie, represented by Unilever House, and the Freemasons Hospital and Nursing Home.

The main part of the book is devoted to a selection from some of the recent works of Sir Edwin Cooper, A.R.A., exhibited at the Galleries of the Royal Institute of British Architects on the occasion of the presentation of the Royal Gold Medal for Architecture, 1931. This selection is preceded by a foreword by Professor A. E. Richardson who points out evidence of admiration for the Wren tradition in Sir Edwin Cooper's work, and in his buildings the encouragement given to English craftsmanship and an interest for things made by hand: the work of painter, sculptor, carver, metal worker and furniture maker.

The illustrations give exterior and interior views of public buildings, banks, offices, hospitals, schools, houses and cottages.

From The Homes of the Pilgrim Fathers

PAINE HOUSE AND WINDMILL
EASTHAMPTON, LONG ISLAND

AN INTRODUCTION TO ARCHITECTURAL DRAWING. By Wooster Bard Field, A.I.A., Associate Professor of Engineering Drawing, The Ohio State University. McGraw-Hill Book Co., Inc.: 330 West 42nd Street, New York City. 130 pages. Illustrated. $2.50

The purpose of this book is to explain the graphic methods of representing the elements of a simple building—merely an introduction as the title implies. Chapters are devoted to plan, elevation, sections, working drawings and architectural symbols with detail drawings of walls, doors, windows, stairways and fireplaces. There are a number of study problems of design and lettering at the back of the book.

THE HOMES OF THE PILGRIM FATHERS IN ENGLAND AND AMERICA (1620-1685). By Martin S. Briggs, F.R.I.B.A. Oxford University Press, London; and 114 Fifth Avenue, New York City. 211 pages. Illustrated. $4.75

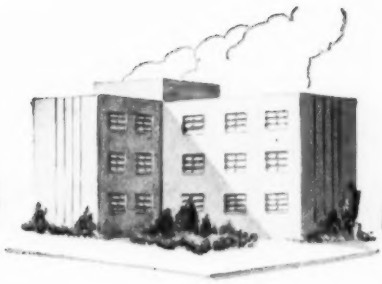
The author approaches the subject by tracing the origin of the houses erected during the seventeenth century by the early colonists to their predecessors and contemporaries in the districts of England, especially Essex, from which the colonists came. He proves his point with specific examples of Pilgrim homes in England and their American counterparts, giving descriptions of the originals and much interesting information regarding the locale and period.

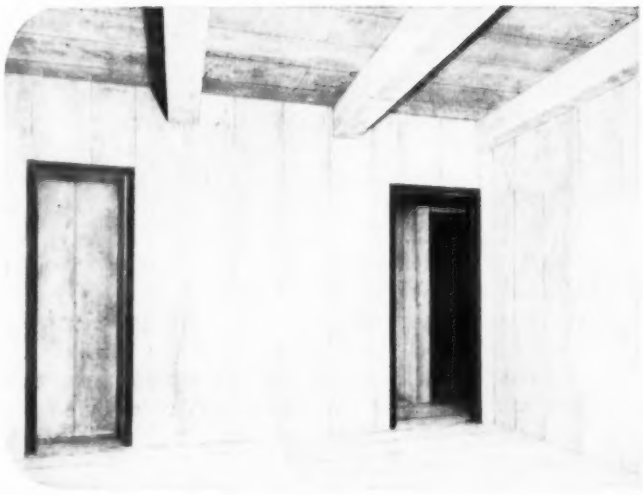
It is pointed out that during their exile in Holland and before the landing in New England, the Pilgrims may also have assimilated some ideas from the buildings which surrounded them in their daily life, and illustrations of early Dutch architecture are compared with the homes here.

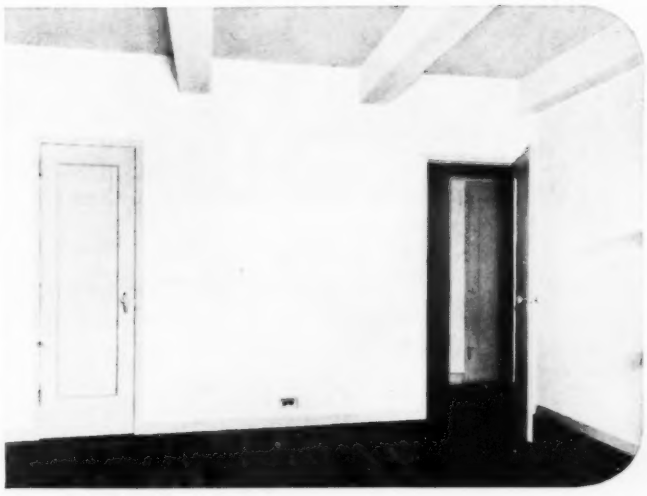
The landing of the Pilgrim Fathers on these shores is described and a graphic account given of the first ventures in building, dwelling in detail on the oldest surviving timber houses dating from about 1635.

There is an appendix on The Influence of Essex on Early Brickwork in America, and a bibliography accordiing to chapters.

SIMPLIFY YOUR HOUSING PROBLEM







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CITE HOSPITALIERE DE LILLE. Paul Nelson, Architect. Editions "Cahiers D'Art": 14 Rue du Dragon, Paris, VI^e^. Text and 54 plates. 110 Frcs., including mailing costs.

To an American-born architect, Paul Nelson, has been entrusted the planning and designing of this Health City of Lille, which will include a medical center, a pavilion for private patients, a school for nurses and midwives, a home for the pensioned, and the general services. Mr. Nelson was inspired to a certain extent by the Columbia-Presbyterian Medical Center in New York, but has simplified the plan, also keeping in mind the Le Corbusier technique of design.

The general text and captions for the plates are in French, English and German, and careful detailed information is given of all the hospital departments and their functioning. A general plan of the 72-acre tract of land and buildings is followed by detailed floor plans of each of the various buildings. The plans are made easy to read by the use of color. Elevation drawings are also given.

It is hoped in Lille that this medical center may become the most complete in Europe and Mr. Nelson has planned very carefully for future expansion or change. His most novel ideal, patented, is the exterior wall. Believing that interior flexibility depends on the exterior flexibility, he has designed a wall which is not only hermetically sealed and fully insulating but which permits any interior adaptation by the interchange of the opaque or translucid units of which it is composed.

ARCHITECTURAL ACOUSTICS. By Vern O. Knudsen. John Wiley & Sons, Inc.: New York. 617 pages. Illustrated. $6.50

In the increasing literature on the subject of acoustics this book takes first rank for its scholarly completeness. The author, associate professor of physics in the University of California, sets forth the fundamentals of acoustics, tabulates materials and construction types, and works out problems in acoustical designing with a clarity and thoroughness that renders the book invaluable for reference.

The first part deals briefly with elementary facts of physical and physiological acoustics. In the second part—the main substance—are presented basic principles and data governing the design of buildings: reverberation, amplification, absorption and insulation of sound, with recommendations for acoustics of auditoriums, speech halls and music rooms. Numerous tables give recent research findings and test data on sound-absorptive and sound-insulative materials; for their practical value these tables are really excellent. Specific design problems are presented in the final part of the book—schools, churches, commercial buildings, theaters and music buildings, radio-broadcast and sound-recording studios, and all types of residential buildings. Numerous diagrams and charts supplement the text.

A MODEL CITY CHARTER. National Municipal League: 309 East 34th Street, New York City. 106 pages. $1

The 1933 revision is the fourth edition of this historic document, the others having appeared in 1900, 1915 and 1925. In the current version the text has been clarified and improved in view of experience and demonstrated administrative practicality of the city manager plan. The sections on city planning and zoning have been completely revamped and brought in pace with recent advances in these fields. Slum clearance and blighted area provisions appear for the first time.

MODERN CREATIVE DESIGN AND ITS APPLICATION. By Herbert A. Fowler, with assistance of Ross T. Bittinger in the illustrative material. Published by George Wahr: Ann Arbor, Michigan. 270 pages, illustrated. $4.50

The principles of design revealed by Prof. Fowler in his treatise are also taught to the students in the College of Architecture of the University of Michigan. The practical value of these principles is perhaps best illustrated by reprinting a few typical student problems culled at random from the assortment which appears at the end of each chapter:

Problem 8. ("Theory of Color"—page 93). "To illustrate the use of the third, fifth and seventh interval combination of hues by means of an all-over pattern developed by extended rhythm method."

Problem 12. ("Nature and Design"—page 140). "To establish by research the rhythmic movement of reptiles and fishes and then to utilize this knowledge by developing an occult balance panel in naturalistic design."

Problem 12. ("Geometric Relations"—page 200). "To establish the various interests, in terms of design, of the system of the $\sqrt{3}$ rectangle and $\sqrt{3}$ triangle."

Problem 18. (page 201). "A fireplace built on system of golden section."

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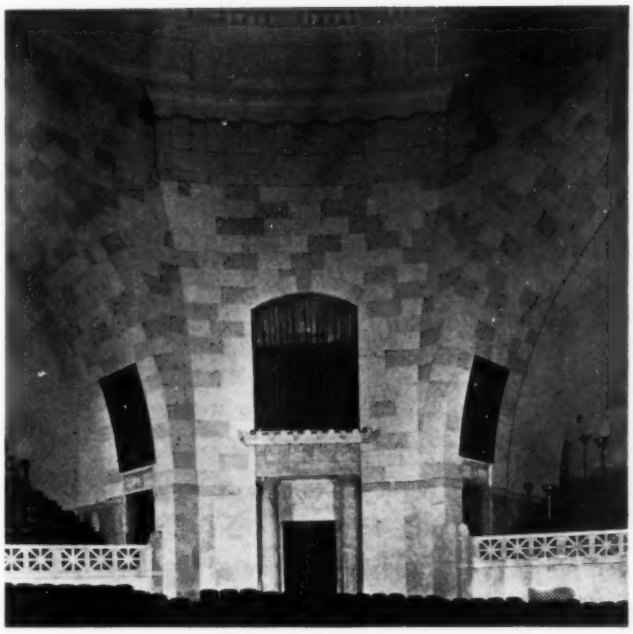

Formerly a place dreaded by speakers and singers, the Louisville Memorial Auditorium now possesses perfect acoustics, thanks to the installation of Armstrong's Corkoustic. E. T. Hutchings, Louisville architect, solved the problem by specifying this efficient, decorative material.

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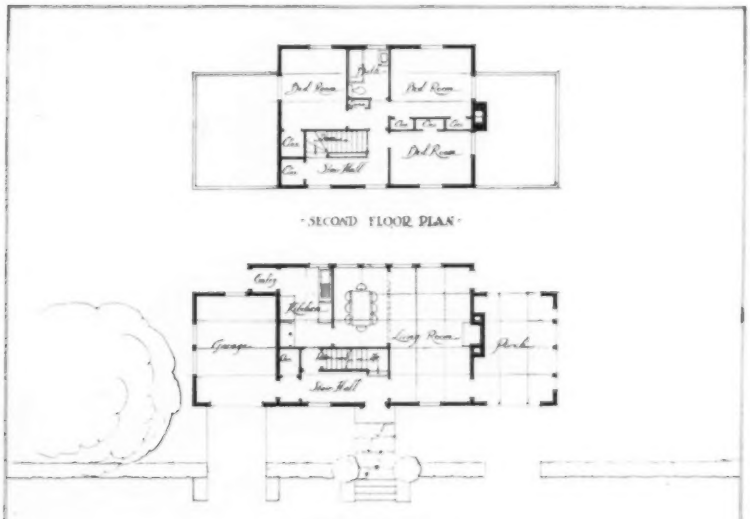
PUBLISHER'S PAGE

In this issue is featured the New Home Office Building for the Metropolitan Life Insurance Company, designed by D. Everett Waid and Harvey Wiley Corbett, architects. During the War, Mr. Waid was department director of production of housing for the Emergency Fleet Corporation. He is an ex-president of the American Institute of Architects and was awarded a medal "for distinguished work" by the New York chapter, of which he is also an ex-president, in 1929. Mr. Corbett collaborated on the designing of Rockefeller Center; the Bush Terminal Office Building and Roerich Museum, all of New York, are among his work which includes also the Bush Building in London. He is chairman of the architectural commission for the Century of Progress Exposition in Chicago and designed the General Exhibits Group there.

The Industrial Recovery Act set up a formula of loans, subsidies and legal adjustments which, for the first time, made large-scale modernization and rebuilding of American cities practically possible. The policies of the Housing Division are so well considered, farsighted and practical as to commend themselves equally to the layman and specialist. A complete statement of policies of the Division appears in the opening pages of this issue.

(Left) Harvey Wiley Corbett
(Right) D. Everett Waid



In Next Month's Issue

The cellular-steel unit house designed by H. T. Lindeberg, employing an extension of the use of the module. To demonstrate the adaptability of his new construction system, Mr. Lindeberg has made a series of drawings illustrating plans and elevations of small and large houses.

Further developments by the Federal Emergency Administration of Public Works.

A portfolio of country houses and suburban dwellings.

Other features include remodeled houses, and low-cost housing projects with a complete discussion of their financial set-up.

Harris & Ewing

CODE COMMITTEE OF THE CONSTRUCTION LEAGUE OF THE UNITED STATES

Reading from left to right: (standing) Secretary, J. W. Follin, and W. T. Chevalier, Director, Engineering Publications, The McGraw-Hill Publishing Company, New York City: (seated) A. E. Horst, Secretary-Treasurer, Henry W. Horst Company, Engineering Contractors, Rock Island, Illinois, and Philadelphia: F. P. Byington, General Manager, Architects' Service Department, Johns-Manville Corporation, New York City: Chairman, S. F. Voorhees, Voorhees, Gmelin and Walker, architects, New York City: Vice-Chairman, J. P. Hogan, Parsons, Klapp, Brickerhoff and Douglas, engineers, New York City: C. H. Dabelstein, W. F. Dabelstein Company, Master Painters and Decorators, New York City. Two absent members of the committee are P. W. Donoghue, P. W. Donoghue Company, Plumbing Contractors, Boston, and William Steele, 3rd, Vice-President, William Steele and Sons, Inc., Builders, Philadelphia.

Keystone

HUGH S. JOHNSON

THE ARCHITECTURAL RECORD

SEPTEMBER, 1933 VOLUME 74 — NUMBER 3

HOUSING AND SLUM-CLEARANCE PROJECTS ELIGIBLE FOR LOANS AND SUBSIDIES

Slum-clearance and low-cost housing projects constitute the most novel and potentially the most important element in the Emergency Public Works Program. They are capable of furnishing maximum reemployment in professions and industries which have suffered most from the depression, of increasing consumer purchasing power without augmenting consumer goods, and of producing a noncompetitive type of capital goods. They will go further towards reviving urban real estate and building than any other economic factor. At the same time, they offer an opportunity for replanning congested cities and providing sanitary homes for income groups that have heretofore lived in sub-standard housing in socially unwholesome neighborhoods.

The Industrial Recovery Act set up a formula of loans, subsidies and legal adjustments which, for the first time, made large-scale modernization and rebuilding of American cities practically possible. The formula required cooperation from local communities—states, municipalities and other public bodies—and the extent to which it would be employed would depend upon the ability of the Housing Division to formulate policies and procedures conforming to the actual needs and traditional attitudes of taxpayers, mortgage holders, elective public officials—the varied interests, conservative and progressive, individualistic and socially-minded, which determine the popular sentiment of a community.

The policies and procedures of the Housing Division published as of July 31 are so well considered, farsighted and practical as to commend themselves equally to the common sense of the layman and the technical appreciation of the specialist. The statement of policies with respect to housing and slum-clearance which follows is reprinted from Circular No. 1 of the Federal Emergency Administration of Public Works, entitled "The Purposes, Policies, Functioning and Organization of the Emergency Administration," (Government Printing Office, Washington):

ARTICLE I. TYPE OF DEVELOPMENT WHICH MAY BE FINANCED UNDER THE PROVISIONS OF THE ACT

SECTION 1. *Summary of sections applicable to housing.*—The act, sec. 202 (*a*) directs the Administrator to prepare a comprehensive program of public works which shall include construction, reconstruction, alteration or repair under public regulation or control of low-cost housing and slum-clearance projects. Not only construction but also reconstruction, alteration, or repair of housing, is provided for. Slum clearance and low-cost housing are differentiated so that slum-clearance need not necessarily involve the construction of low-cost housing, and vice versa.

Section 203 (*a*) (1) authorizes the Administrator to construct, finance or aid in the construction or financing of such projects.

Note (1).—Applications for housing and slum-clearance projects will be made direct to the Administrator at Washington.

Section 203 (*a*) (2) authorizes the Administrator to make grants to *States, municipalities, or other public bodies* for the construction, repair, or improvement of low-cost housing and slum-clearance projects, but provides that no such grant shall be in excess of 30 per cent of the cost of labor and materials employed upon such project. Under this section grants can be made to States, municipalities, or other public bodies, having the power to undertake housing projects directly, in aid of such projects and either in conjunction with, or independently of, loans to them. Even though such bodies do not have the power to undertake housing projects directly, they can assist such projects by the construction of adjacent parks, playgrounds, etc., in aid of which they would be eligible for a grant as well as a loan.

ARTICLE II. POLICIES OF THE ADMINISTRATOR APPLICABLE TO HOUSING

1. *General.*—The Administrator in formulating the comprehensive program of public works directed by section 202 of the act will consider each project with regard to its relation to the entire program. In formulating this program the Administrator will endeavor to keep in mind trends in the shift of population and the relocation of industry.

2. *Employment.*—The declared purpose of the act is to further employment. The building industry includes both skilled and unskilled workers. It distributes purchasing power promptly; payrolls constitute a very large proportion of the cost of housing. The construction of adjacent parks, open spaces, playgrounds, etc., will provide employment for additional groups.

3. *Groups to be housed.*—What is low-cost housing must necessarily depend upon local conditions. The Administrator will prefer projects for those lower-income groups for which modern sanitary housing is not now available and in which preference in tenancy is given to such groups. In order to insure low-cost housing, the applicant must be limited by law or charter provision as to rents, dividends, and interest on securities. No loans will be made to speculative building projects.

4. *Location.*—New housing should preferably be located with reference to a long-term plan for the economic development of the community, and with particular reference to availability of employment, existing housing, transportation facilities, schools, and utilities. It should not be confined to urban regions or crowded centers but should also include sections where the price of land is such as to permit the furnishing of housing for the lowest-income groups, while maintaining standards of design set forth below.

5. *Land.*—Since the purpose of the act is to further employment, projects on low-cost land and involving a low ratio of land cost as compared with labor and material cost will be favored. Preference will also be given to projects which include land as part of the equity investment and which consequently permit the maximum use of Federal funds for construction.

The Administrator will consider the value of land on the basis of earnings reasonably to be anticipated from its use for low-cost housing. Costs in excess of such value, whether based on speculative considerations or on the alleged value of the land for other purposes, will not be recognized.

6. *Standards of design.*—(*a*) The project is to be conceived as a unit in a neighborhood community. The distribution of various types and sizes of single and multifamily dwellings should be fixed with respect to variation in income groups and in the sizes of families. The monotony resulting from excessive repetition of one size or type of dwelling should be avoided.

(*b*) Preference will be given to projects with a low coverage. Site-planning should be such as to insure permanent light, air, outlook, recreational facilities and garden setting.

(*c*) Projects should utilize existing streets and physical utilities insofar as possible and should be isolated from through traffic but convenient to transportation and highway facilities.

(*d*) The buildings should be simple in design but well constructed, to insure low maintenance and operating cost. Preference will be given to fireproof construction, in order that a low depreciation factor may be safely used.

(*e*) The project may include provision for subsistence gardens, stores, and such other commercial facilities as may properly be considered part of a housing development.

ARTICLE III. PUBLIC REGULATION OR CONTROL

Regulation or control will be exercised by the Administrator by contract and charter provisions and by agreements for the trusteeing of capital stock. In States where State housing commissions or other regulatory bodies have been created by law and are actually organized and in effective operation, the Administrator will ordinarily require that application shall be made also to such bodies.

ARTICLE IV. FINANCING

SECTION 1. *Self-liquidation.*—No housing loans will be made which cannot be safely self-liquidated during the useful life of the building.

SEC. 2. *Interest.*—For the purpose of making application a rate of 4 per cent may be assumed, with the understanding that this may be subject to adjustment.

SEC. 3. *Amortization, percentage, and period of loan.*—The percentage of loan will be determined with relation to each particular project, and the rate of amortization will be based on the useful life of the building. No loan will be granted for a period greater than the useful life of the building, not to exceed 30 years, which will be determined by the quality and character of construction. For the purpose of making application, an amortization period of 30 years on fireproof and of 25 years on nonfireproof buildings may be assumed, with the understanding that this may be subject to adjustment. Savings in interest resulting from

the reduction of the loan will be added to the amount of amortization due each year, so that the annual sum of interest and amortization payments will be uniform throughout the life of the loan.

SEC. 4. *Type of security.*—The type of security will depend upon the character of the project. In most cases the Administrator will purchase first-mortgage bonds in the principal amount of the loan granted, issued under and secured by an indenture and mortgage running to a trustee approved by the Administrator. Where housing projects are undertaken by States, municipalities or other public bodies, the Administrator may purchase the general obligation or revenue bonds of such bodies.

SEC. 5. *Sales Projects.*—Where the sale, rather than the rental of housing units, is contemplated, the Administrator will ordinarily require that the units be rented for the period of the loan, the tenant to be given the option to purchase at the expiration of the period and to apply past rental payments on account of the purchase price. Obviously in such case the loan would be, not for the period of the useful life of the building, but for the customary period of installment sales contracts of units of this type. The Administrator will allow the sale of an individual unit before the expiration of the period, upon the completion of all payments only if the release of the unit from under the mortgage would not impair the value of the remaining units.

SEC. 6. *Equity investment.*—The equity investment, through the purchase of securities or otherwise, may be furnished in the form of cash, land, materials, services, or labor. Municipalities and other governmental bodies may contribute equity to the project in the form of land through street vacations and also by acquiring for park purposes land which would otherwise be needed to provide adequate open spaces surrounding the improvements.

SEC. 7. *Contracts.*—In all cases the cost of the entire project must be guaranteed by the applicant. All subcontracts and purchase of materials must be awarded on a competitive basis. In case a general contractor has already been selected which precludes competitive figures being taken in the letting of the general contract, a guaranteed maximum cost of construction shall be stated which shall include an agreed, stated amount as the contractor's fee. Under this type of contract all construction costs will be audited and the loan adjusted accordingly. In other cases competitive figures in the letting of the general contract will be insisted upon.

APPLICATIONS BY LIMITED-DIVIDEND CORPORATIONS FOR HOUSING LOANS

The following procedure has been adopted for use by limited-dividend corporations in applying for loans. There is no fee for filing an application. The Housing Division, it will be seen, is not asking promoters and architects to develop complete working plans at the start, but will make allocation of funds on the basis of preliminary applications. Only when general approval has been given to such applications will complete details be required. The application form here reprinted appears in Circular No. 4 of the Federal Emergency Administration of Public Works, dated August 11 (Government Printing Office, Washington):

GENERAL INSTRUCTIONS

In order to save applicants unnecessary expense in preparing detailed plans, specifications, and financial statements, only the information outlined below will be required for a preliminary application for a loan. If the examination of such a preliminary application indicates that the project is of a satisfactory character, the applicant will be encouraged to prepare the additional plans and data required for a final application.

This form of application is designed for private limited-dividend corporations formed to undertake the particular housing project. Other applicants may be required to furnish some additional information.

Applications, together with supporting data, should be submitted in duplicate direct to the Administrator of Public Works, Division of Housing, Washington, D. C. Preliminary applications for loans for low-cost housing or slum-clearance projects should *not* be submitted to State advisory boards.

The estimated costs required to be given should be based on the labor requirements and other special conditions set forth in the National Industrial Recovery Act, particularly section 206.

INFORMATION REQUIRED

I. The Applicant

(*a*) Name and address.

(*b*) Name, title, and address of official representative or representatives with whom correspondence should be conducted.

(*c*) Name and address of applicant's attorney.

(*d*) Name and address of applicant's architect and consulting engineer.

(*e*) Name and address of each officer and director of the corporation.

II. Construction Period

(*a*) Estimated time that will elapse after funds are allocated before—

(1) Work can be commenced.

(2) Project will be completed.

(*b*) Estimate of average number of men to be employed 30 hours per week directly on the project.

III. Character of Project

(*a*) *Site*:

(1) A map, showing the location and area: (Note—Physical features should be shown by two maps: '(I) Key map of city showing these facilities and proposed site: (II) Sectional map showing these facilities in greater detail.)

(2) A statement of the assessed valuation of the land necessary for the project and the established ratio between assessed value and fair cash value.

(3) Tax rate.

(4) Any unusual conditions adversely affecting the cost of the project.

(5) Description of present improvements, existing utilities, etc.

(6) Approximate number of present owners and proposed method of acquisition of site.

(7) Brief statement of advantages and disadvantages of the site for this particular project.

(8) Relation to planned growth of the city, employment and shopping centers, transportation facilities, schools, recreational facilities, etc.

(*b*) *Proposed improvements*:

(1) Character and type of building (fireproof, fire-resisting, ordinary construction, number of stories).

(2) Number of apartments or houses.

(3) Estimated number of persons to be housed.

(4) Ground coverage.

(5) Number and size of stories (if any).

(6) A sketch of the site layout and sufficient specifications and architectural drawings of a typical unit in sketch form to illustrate the type and character of the buildings contemplated.

IV. Management

A description of the proposed permanent operating and management organization.

V. Summarized Cost and Income Statement

(*a*) *Cost.*—An estimate of the cost of the project summarized under the following items:

(1) Land (cost per square foot and total).

(2) Utilities, landscaping, streets, and other improvements.

(3) Buildings (cost per cubic foot and total).

(4) Architects' and engineers' fees.

(5) Preliminary and organization expense.

(6) Carrying charges during construction.

(7) Other costs.

(8) Total.

(9) Condensed estimates of the cost of labor and materials, stated separately.

(*b*) *Financing*:

(1) Amount of mortgage loan.

(2) Equity interest.

(3) Total.

(*c*) *Annual income*:

(1) Number of rooms and rental rate per room per month.

(2) Total annual rental.

(3) Linear feet of stores, rental rate, and total annual rental.

(4) All other annual income.

(5) Total gross income.

(6) Deduction of allowance for vacancies.

(*d*) *Annual expense*:

(1) Operating expense, number of rooms, and rate per room per annum.

(2) Taxes.

(3) Insurance.

(4) Total cost of operation.

(5) Balance available for interest and amortization.

(6) Interest on mortgage loan (assume 4 per cent).

(7) Amortization (assume a constant rate of 1.35 per cent on fireproof construction and 2.4 per cent on ordinary construction).

(8) Total interest and amortization.

(9) Balance available for dividends and reserves.

VI. Planning and Related Data

(*a*) Statement as to whether or not project is part of a larger plan or long-range program of development and, if so, give brief description of other parts of plan or program.

(*b*) Statement as to whether or not there is a city or regional planning board and/or housing board, whether this project has been submitted to such board, and the views of such board, if any, in regard to it.

(*c*) Statement as to whether the community is part of a metropolitan district and, if so, whether the project is coordinated with the plans for metropolitan development.

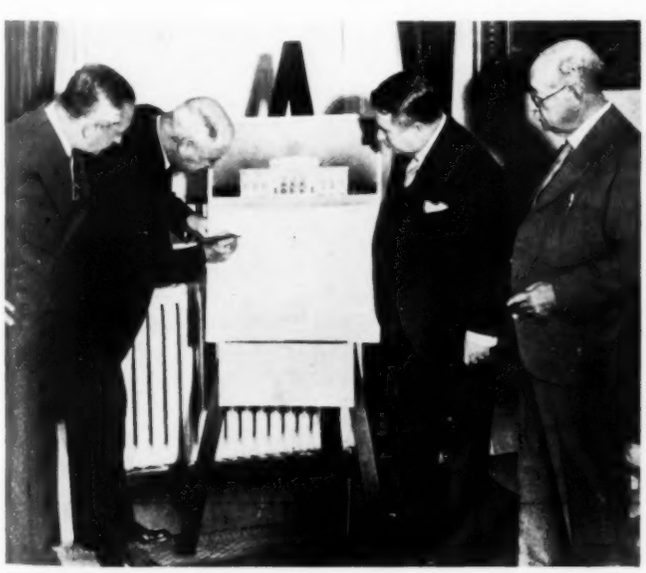
(*d*) State whether the project has been approved by governmental or civic bodies and, if so, by whom. Give any other evidence of local sentiment favoring the project.

With the PUBLIC WORKS ADMINISTRATION in WASHINGTON

Keystone
Harold L. Ickes, Secretary of the Interior, who is in charge of all public works projects.

Keystone
(Right) Colonel H. M. Waite, deputy administrator.

Keystone
The national planning board, created to help Secretary Ickes and the cabinet advisory board to develop a national plan for public works of all kinds, photographed when it convened in New York City, August 14. Left to right: Dr. Wesley Mitchell, Professor of Economics at Columbia University; Frederic A. Delano, chairman; Charles W. Eliot, 2nd, Cambridge, Mass., executive officer, and Prof. Charles E. Merriam, chairman of the Department of Political Science of the University of Chicago.



Keystone
Left to right: L. W. Robert, Jr., Asst. Secretary of the Treasury; Postmaster General James Farley; Silliman Evans, Assistant Postmaster General, and James A. Wetmore, Acting Supervising Architect.

Acme
Dr. Leo Wolman, General Hugh S. Johnson and Dr. Alex Sachs of the statistical division talking things over at a conference on an industrial code.

WE MUST BUILD SCHOOLS

By JAMES O. BETELLE, Architect

At no time since the World War have the school buildings of the country been so over-crowded as they are now. This fact is recognized by both the educator and the general public. Immediate steps to remedy these conditions are about to be taken, because the citizens of the country will not see their school system suffer, as they recognize it as one of the safeguards of the nation.

The present administration in Washington realizes this great need for new school buildings, and has made liberal provisions in the National Recovery Act to encourage the building of schools. The purpose is two-fold. In the first place, it is to provide work for the unemployed, and in the second place to see that the education of the future citizens of the country is not neglected.

It can be readily seen why there is a great shortage in schools and why there will be a more acute shortage as time goes on, if the situation is not remedied immediately. In the first place, the National Recovery Act prohibits the employment of any one under sixteen years of age. Up to this time working papers could be obtained by pupils when they had reached the age of fourteen years. This means that practically all of the several millions of children throughout the country between the ages of fourteen and sixteen who now go to work will be kept in school two years longer, and additional school facilities will have to be provided for them. Those between these ages who will have to be dismissed by their employers under the National Recovery Act will return to school for some sort of instruction, which in many cases will be vocational in character. This will increase the demand for vocational schools.

There has also been a normal increase in school population which goes on from year to year in every community. There will also be many hundreds of thousands of pupils throughout the country who will remain to complete their high school courses, due to the fact that if they leave school there will be no suitable positions available for them. To make a bad situation worse, there have been practically no new school buildings erected for the past three years, owing to the depression. The culmination of all these conditions brings about a very serious school building shortage.

In various parts of the country this school building shortage has become acute. Boards of education and school authorities have not brought it very forcibly to the attention of the people, because they realize that under present conditions the public mind is not at all receptive to the idea of authorizing the expenditure of money for school buildings, which would naturally increase their taxes. Now that the United States Government has stepped in to encourage school building construction, the situation will be different. In the first place, the Government agrees to donate, as a gift to any community erecting a school building, up to thirty per cent of its cost, and to extend a loan of the balance of the money necessary in case the bonds can not be otherwise disposed of.

Under the National Recovery Act, such public works projects as sewers and water supply systems, river and harbor improvements and flood control, are also to receive a grant from the Government of funds up to thirty per cent of their cost. It is realized that the City and State authorities will be more inclined to make application for loans for sewer systems and water supply systems than for school buildings, because the sewer and water systems are income producers at once, and will not increase the tax rate, as they pay for themselves in time. A school building, however, while increasing the wealth and beauty of the community, is a source of additional expense, which in turn reflects in the tax rate. They are nevertheless an absolute necessity if crime and delinquency are not to flourish in this great country of ours. For this reason it is realized that the citizens of the various communities will have to be educated to the desirability of erecting new school buildings at this time, and urged to make application to the Government for loans for this purpose.

The Government will, therefore, undoubtedly make unusual efforts in the way of publicity to urge the various communities where a new school is needed, to take advantage of the present economic conditions and the thirty per cent grant from the Government, and to erect their new school buildings at once. Communities should realize that not only are new school buildings a necessity at this time, but that it is also a patriotic duty to build them now. Sewers, water supply systems and roads absorb a vast quantity of unskilled labor, but will employ practically no skilled labor. It is therefore necessary to erect buildings in order to bring back recovery of the building industry and employ some of the skilled mechanics who are now unemployed. In other words, the erection of a new school will take many skilled workers off the unemployment relief lists, put them on a payroll, and permit them to produce something for the money paid them.

Boards of Education naturally appreciate the new school building needs; and it is comparatively easy to convince the few members of the town council or governing body; but it is a very difficult task to win over the citizens at large, whose only idea for the moment is to keep down the tax rate and spend as little money as possible. There is an

Pirie MacDonald

Believing that conditions favor a general revival of school building and that architects can help to promote the revival, the editors have asked James O. Betelle to explain the sort of promotion in local communities that is just now most timely. The need for additional school facilities exists and is recognized by local school authorities, but public officials must have public sentiment behind them for any project that seems to call for increased taxation. It is not popularly understood that money saved by inadequate school provisions may have to be spent on reformatories. The problem in a great many communities is how to inform public opinion as to the advantages of enlarging school facilities immediately with the aid of loans and subsidies from the Federal Emergency Administration of Public Works.

Mr. Betelle's firm, Guilbert and Betelle, is reputed to have designed and supervised the erection of some $100,000,000 worth of educational structures since it was founded in 1910. He is a Fellow and a Regional Director of the A.I.A., lectured on school buildings and their equipment for eight years at Teachers' College, Columbia University, and for two years was president of the Newark Chamber of Commerce.

old saying that in order to make money you have to spend money, and this saying still holds good.

Similar methods to those which have been heretofore employed in the authorizatior. of local bond issues could be used to advantage at this time to promote the erection of much needed school buildings. The public can be informed and educated on the subject by means of the radio, newspaper and magazine articles, pamphlets, talks to parent-teacher associations and other civic groups. This work would be done by members of the educational system who would present the particular needs of their school system. This local effort, together with the general encouragement and effort which the Government will make to bring about the erection of new school buildings, will undoubtedly have its effect.

Those seeking more information about the Federal Emergency Administration of Public Works are referred first to the National Industrial Recovery Act itself as the source of all authority. In addition, two supplementary pamphlets have been issued, explanatory in character and containing much miscellaneous information: Circular No. 1 is entitled "The Purposes, Policies, Functioning and Organization of the Emergency Administration—The rules prescribed by the President—Dated July 31, 1933." Circular No. 2 is entitled "Information required with applications for loans to States, Counties, Municipalities, and other public bodies—Dated August 1, 1933."

Besides many other items of information and interest, Circular No. 1 states the following:

"The President is empowered to make grants to states, municipalities, or other public bodies, for the construction, repair or improvement of any project approved by him, not in excess of thirty per cent of the cost of the labor and materials employed upon such project. The terms are such as the President shall prescribe. . . .

"The United States will bid par and accrued interest for bonds to finance projects of public bodies, approved by the Administrator, provided all bonds bear interest at the rate of 4 per cent or more. In the event such bonds bear interest at the rate of more than 4 per cent, the difference between 4 per cent and the coupon rate will be refunded by the United States from time to time during the period while such bonds remain in the possession of the United States.

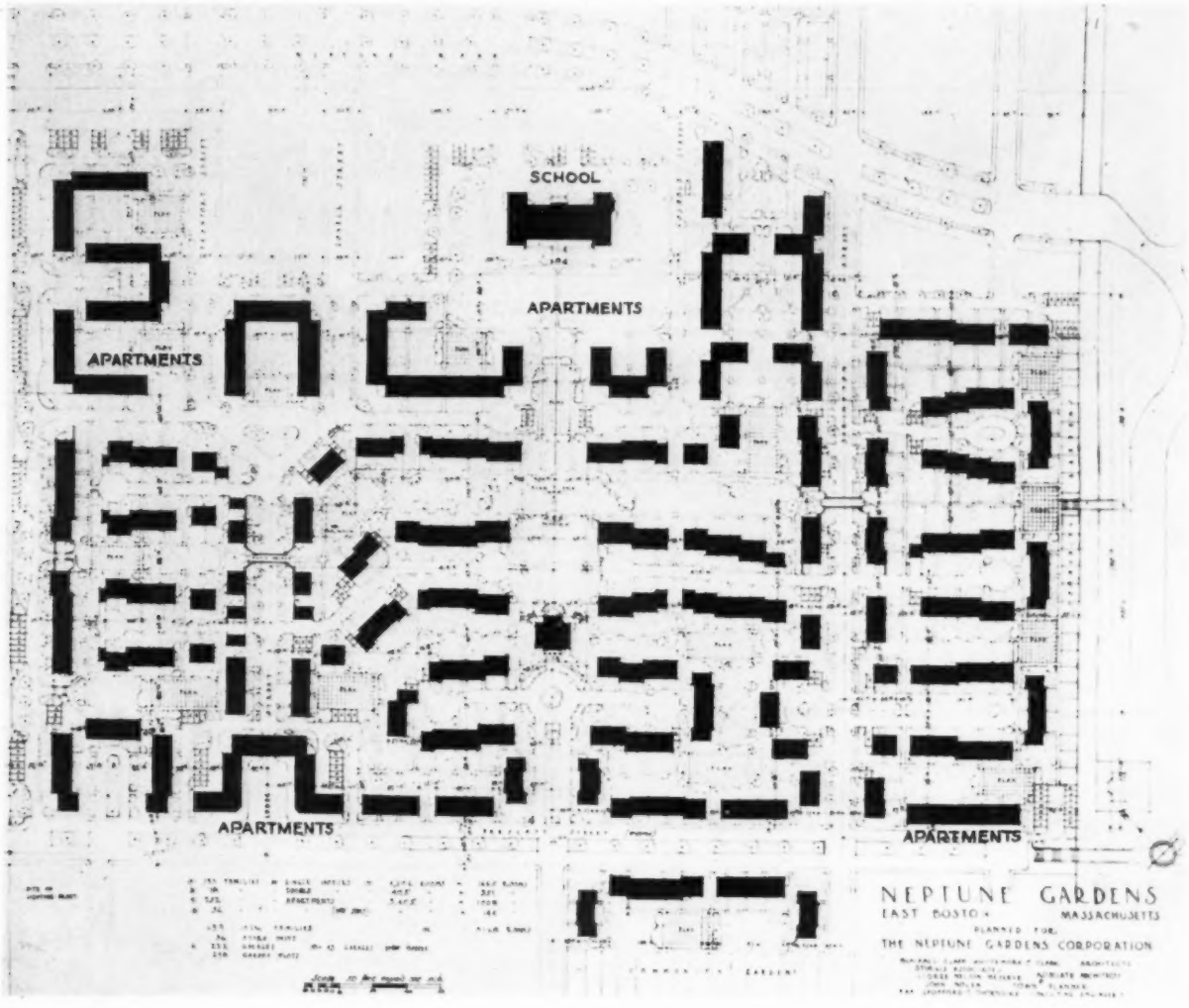
"Bonds and obligations under contract of lease are to be annually amortized pursuant to State statutes and according to the life of the project not to exceed 30 years, except in the case of such projects as obviously have a longer life, and in no case to exceed 50 years."

Circular No. 2 sets forth how to present a project to the Administrator for consideration and approval. Four complete copies of all papers and drawings must be submitted; also the amount of loan requested, description of the project, revenue and expenses of operating the project, and financial and legal data of the community, etc.

All well-informed citizens should strive to bring about the erection of needed school buildings at this time. In the first place, it is a patriotic effort to put skilled mechanics to work; in the second place, labor and material prices are low, as it is a buyers' market. There is the further advantage of a substantial grant of money from the Government to fill a community need, which has a vital bearing on the future of our country.

Due to no fault of their own, the younger generations have suffered much during the past few years of deplorable economic conditions. We owe them a great debt, the repayment of which will enable them to obtain an education which in turn will make them useful and independent citizens of the future. Already our penal institutions and reformatories are far too full of young delinquents. Such a situation can be greatly overcome by proper training and education which has such a tremendous influence on every one, especially on the youth of a nation.

FIRST HOUSING PROJECTS APPROVED BY PUBLIC WORKS ADMINISTRATION

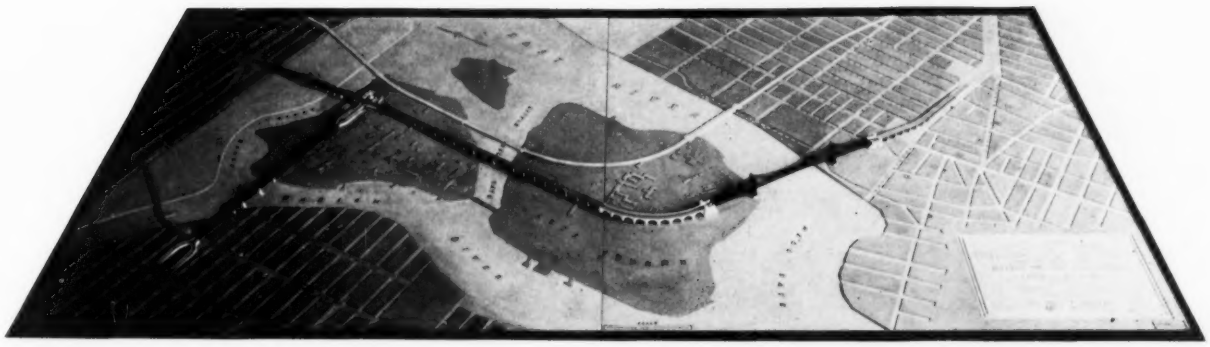


Air view of proposed site for Neptune Gardens housing development.

Announcement of first allotments to housing projects, subject to a satisfactory contract with the Federal Emergency Administration of Public Works, is without prejudice to other projects now being considered, Administrator Ickes states.

The initial allocation of funds for housing projects is tentative under the terms of the resolution adopted calling for completion of plans and specifications for the housing and a contract with a limited dividend corporation acceptable to the Administrator.

Thirty-five housing projects are now being considered by the housing division. Tentative action on the first projects does not in any way indicate that they are better than many others still under examination, but they have been inspected to a point that permitted tentative approval.



The Triborough Bridge, approved for a Federal loan, will connect Manhattan, Queens and the Bronx, New York. Total length, as shown in this view of a model, will be 17,710 feet. Main bridge will provide 8 lanes for vehicular traffic on a 74-foot roadway, and two 5-foot sidewalks. Engineers: Edward A. Byrne, City of New York Department of Plant and Structures; Ralph Modjeski, consultant for suspension bridge; Ash, Howard, Needles and Tammen, consultants for vertical lift span.

Tentative approval of a $3,500,000 *loan to Neptune Gardens, Inc., for a model housing project in Boston.*

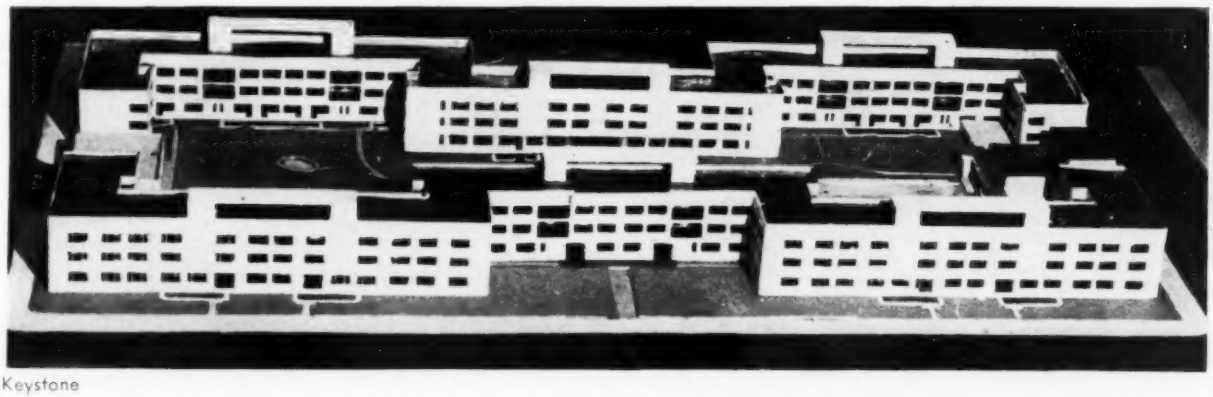
This will enable construction of over 3,000 rooms to rent at $8.50 per room on the basis of 4 per cent interest on the loan, according to information submitted to Robert D. Kohn, Director of Housing. Estimated value of project is $4,000,000.

The project is to be built on 44 vacant acres of land in East Boston costing about 85 cents a square foot and adjoining Marine Memorial Park within a few minutes of the Park Street station. The site is close to a public park and is designed to provide playgrounds for children, a small local library and even a group of small farm garden plots for the use of tenants.

There will be approximately 700 residential units, totaling 3,170 rooms in brick two-story row houses, two-family houses, and three-story apartment buildings covering approximately 17 per cent of the land.

Work can be started on this project in about thirty days, giving approximately 1,000 men direct employment on the job for a year while twice as many men will receive indirect employment because of the construction.

The architects are Blackall, Clapp, Whittemore and Clark, with Sturgis Associates and George Nelson Meserve as associated architects. John Nolen, town planner. Fay, Spofford and Thorndike, consulting engineers.



Keystone

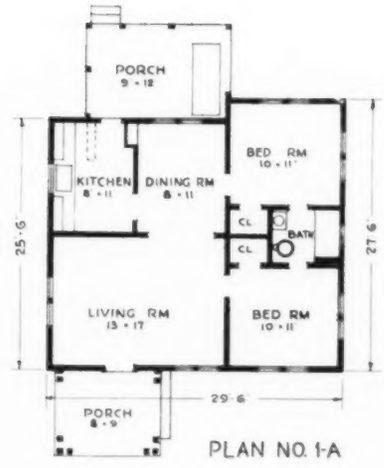
Tentative approval of a $845,000 *loan for a model housing project in Philadelphia.*

The project is to be built by a limited dividend corporation formed by officers and members of the American Federation of Full-Fashioned Hosiery workers which already has control of the land required and is prepared to make a large investment in the project in addition to the government loan. Estimated value of project is $996,000.

The site covers an area of 4½ acres in the Kensington district of Philadelphia. The housing will consist of three-story semi-fireproof buildings, containing 292 apartments, totaling 1,074 rooms. On the basis of 4 per cent interest on the loan, room rents will be approximately $8.40 per month, Director Robert D. Kohn was informed.

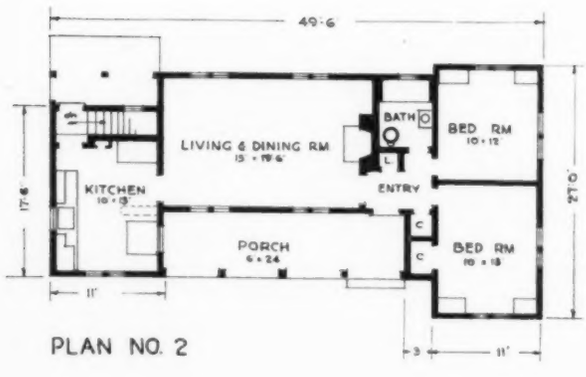
Union officials reported they had plenty of applications for space and they were assured of filling the buildings without any difficulty.

Kastner and Stonorov are the architects.



PLAN NO. 1-A

PLAN NO. 3



PLAN NO. 2

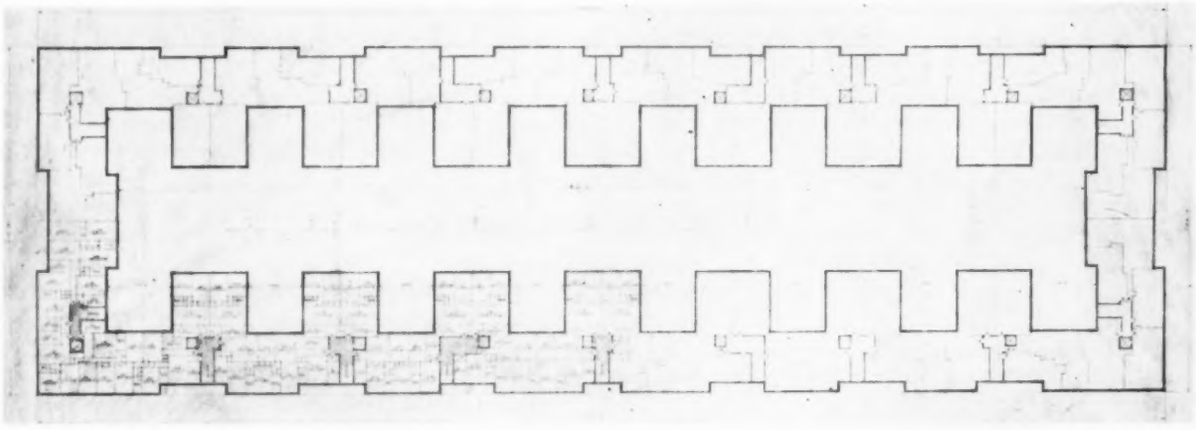
Tentative approval of a loan of $40,000 to the Hutchinson (Kansas) Suburban Housing Association.

Housing Director Robert D. Kohn was informed the project will provide 20 individual four-room and five-room houses, each situated on two acres of land, renting at $30 per month with the loan on a 4 per cent basis. Estimated cost of the project is $61,000.

The action is interesting as being the first housing loan to a comparatively small city and providing for a project under the Kansas State Housing Laws, which will have some of the characteristics of subsistence homesteads.

The project will give employment to 35 men for six months on the job and twice as much indirect employment.

Elevation and block plan of proposed Spence Estate housing development.



Tentative approval of a $2,025,000 loan to the Spence Estate Housing Corporation for a model housing project in Brooklyn.

This is the first real slum-clearance project to be acted upon by the Public Works Administration. The site covers a block in Brooklyn adjacent to important transit line and shopping center. Options have been obtained on the land but titles and details have not yet been confirmed. The proposed housing will consist of a six-story elevator building with 508 apartments, totaling 2,150 rooms.

The Spence Estate Housing Corporation, which is under the New York State Model Housing Law, is making a large direct investment in the project in addition to the government loan. With the loan on a 4 percent basis, Director Robert D. Kohn was informed the project would furnish model metropolitan housing at under $11 per room per month.

Seelig and Finklestein are the architects.

Tentative approval of a loan of $3,210,000 for a model housing project in Queens Borough, New York.

The project is to be built by a limited dividend company, the Dick-Meyer Corporation, under the New York State Housing Law, for a site in Woodside, Queens Borough, within 20 minutes of central Manhattan. Estimated value of project is $4,169,000.

The proposed housing consists of 10 six-story semi-fireproof elevator apartments, providing in all, 1,632 residential units totaling 5,644 rooms. On the basis of 4 per cent interest for the loan, rates will be approximately $11 per month, Housing Director Robert D. Kohn was informed. The land coverage is only 29 per cent of the ground area.

Theo. Engelhardt is the architect. (Editor's note—Drawings were not obtainable for publication in this issue.)

CODES—
BY AN EYE WITNESS

WILLIAM STANLEY PARKER, Architect

They were strange days, those days in Washington, when the General Code for the Construction Industry was being drafted. "Washington is a madhouse," some one said. "Impossible things being done every day." The Construction Industry Code would seem to prove the truth of that statement.

For years we have discussed the difficulties of the industry. We have seen the wrenches being thrown into the gears, our governmental agencies throwing the largest ones. We have planned sound economic methods of procedure to cure the ills but have observed no practicable way to get them adopted. We have often wondered, many of us, whether it was conceivably possible to enforce any of these desirable procedures that would permit us to function as self respecting members of a profitable and respectable industry.

Is it possible that the descent into the depths of the industry's present deplorable condition has provided the momentum that may perhaps carry us up to some reasonable level of orderliness and self control? The general pervading sense of controlled purpose and cooperative effort that was present at the meetings of the Code Committee of the Construction League, together with the overshadowing suggestion of national power to enforce whatever might be agreed upon as right, gave a peculiar significance to those discussions. They seemed to have passed out of the sphere of academic discussion, so characteristic of many of our Building Congress Meetings, and to have entered a new phase of effective action. We were discussing what ought to be done, and if we came to sound conclusions that we could support before the organized powers of the N. R. A., it was apparently going *to be done.*

An engineer sitting beside me at the meeting of the Policy Committee leaned over and said "Do you notice that there is no antagonism indicated here—everything that is said is constructive." It was true of all the meetings, the negligible exception serving only to prove the rule. Perhaps each one had the same sensation of being carried along on an overwhelming current of events so powerful as to make any attempt to combat it futile and to force all hands to join in an effort to steer a wise course among the obvious rocks and shoals.

Not that any one, probably, had a very clear impression of our destination, or that we would arrive there directly and easily. Indeed the very basic uncertainty of the whole situation was the principal characteristic of the voyage on which we seemed about to embark. But in all this general uncertainty there was one very definite fact that was more than once forced on our attention. The Construction Industry was going to have a code of practice established for it, and there were just two ways in which that could be accomplished. The code of practice could be prepared for itself by the Industry, or it would be prepared for it by some governmental agency. No other alternative could more effectively stimulate cohesion within the industry and a determination to do our own housecleaning.

The fact that the Industry had already prepared itself to meet this emergency is perhaps the most heartening part of the whole affair. What would be happening now if we had not had the cooperative experiences of the past dozen years? The first steps towards the General Code for the Construction Industry just filed with General Johnson were taken at Atlantic City in September, 1920. There, assembled on the invitation of the Executive Committee of the American Institute of Architects, a group of men broadly representative of the Construction Industry decided to organize a National Congress of the Building and Construction Industry. The Building Congresses in Boston and New York were quickly inaugurated, followed by others in Philadelphia and Oregon. Then, after a space the American Construction Council was organized as a national expression of the Congress idea and the Presidency of it was accepted by Franklin D. Roosevelt.

All these organized efforts to weld the loosely coordinated construction industry into some sort of unity of understanding and purpose were carried on under the difficulties inherent in any such undertaking, but with definite results in mutual understanding if nothing more. About two years ago new life developed in the Building Congress movement in various sections of the country, and The Construction League of the United States was started, based solely upon a membership composed of the national associations representative of the different elements in the industry. Some eighteen different associations representing architects, engineers, contractors, subcontractors, and producers joined in this effort to create a truly national coordination of the industry.

When, therefore, the N. R. A. became a dominating factor in our national affairs and codes became the order of the day, the Construction Industry was ready to act. Other codes were developed more rapidly by clearly defined manufacturing industries. Cotton, oil, and other products submitted their codes and each by itself could be settled to suit its own conditions. But then a new type of industry began to submit a code, a type that was one part of a complex, multiple-personality industry and which could not be settled apart from its related industries. The Construction Industry was beginning to file its codes. The need of a correlating agency became apparent at once, which must obviously be broadly representative of the industry if it was to be competent. The Con-

struction League offered its services which were accepted by the Administrator, one may suspect, with considerable relief.

Things happened quickly that hot last week in July. The formal consummation of offer and acceptance; the formal appointment of the Code Committee, which had already been at work and could therefore immediately present its conception of its charter and its procedure; the meeting a few days later of the Code Committee and its Advisory Council of representatives of national organizations; the action at this meeting in support of the idea of a General Code to be drafted by the Code Committee; the immediate submission of a tentative draft of such a code; the brief discussion with some suggestions; the meeting on the following morning, August 1, which approved the slightly revised draft which was presented to the Administrator that afternoon and formally filed on August 7. The first meeting was on July 26. That's fairly quick work!

The quality of the membership of the Code Committee could hardly be higher. In their hands the problem of coordinating the various subordinate codes can be left with confidence. If they continue as the Control Committee to administer the Code, we have reason to hope for as high a degree of success as is conceivable in a problem so full of complexities.

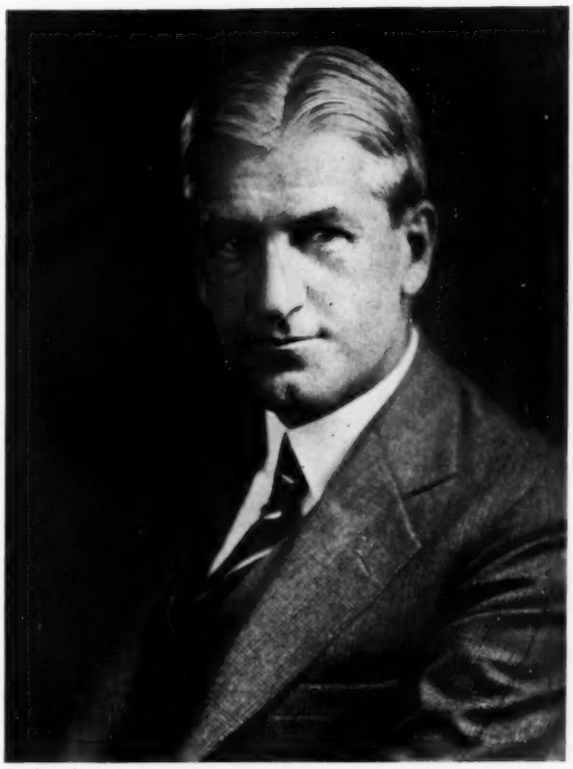
The General Code as submitted is a simple basic code, which does not attempt to cover various controversial matters of conflicting interests and procedures. Those will be undoubtedly ironed out in the process of developing and correlating the various subordinate codes. When these have been developed there will probably appear in them all certain basic provisions which may later be culled out and segregated into a set of general provisions governing the economic operation of the Construction Industry and forming the measuring rod by which to test individual practices that in the past have been allowed to run riot.

And back of these provisions will be power. That power cannot be exerted effectively without a general willingness to cooperate throughout the industry. What it may be able to accomplish cannot be clearly seen by any one at the present time. Its potentialities are quite stupendous. It is a huge experiment in industrial self-government never before tried, I believe, in a complex industry such as ours.

All of us are suffering from the evil effects of various uneconomic practices. Each of us permits himself to practice, to a greater or less extent, some of the undesirable methods that have been developed in self defense, armor put on to protect us from the wrenches thrown by others. Thus the snowball has grown as it rolled.

Surely the Code Committee should be able to count on the cooperation of all those who desire a self respecting construction industry.

August 10, 1933



Bachrach

WILLIAM STANLEY PARKER

The Code of Fair Competition for the Construction Industry was submitted to General Hugh S. Johnson on August 11. It is a master code, to be supplemented by codes for architects and other divisions of the industry. They will all confirm approved professional and trade practices, introducing no innovations beyond prohibiting unfair competition.

The general code defines the construction industry "to mean the designing, the constructing, and the assembling, installing and applying of manufactured parts and products of (a) building structures, including modifications thereof and fixed accessories thereto, intended for use as shelter; and (b) fixed structures and other fixed improvements and modifications, flood control and water power development, reclamation and other similar services required for the public welfare; and the term construction industry is further defined to include all persons who perform such functions, including without limitations those persons commonly known and sometimes defined by law, as architects, engineers, contractors and subcontractors."

The general code was prepared by the Code Committee of the Construction League of the United States, of which S. F. Voorhees is chairman. It will be administered by the Policy Committee of the League with three nonvoting members appointed by N.R.A. Provision is made for appeal from the administrative committee of any group operating under a supplemental code to this National Administrative Committee (Policy Committee of the League) and from it, if necessary, to the N.R.A. Administrator.

Mr. Parker is chairman of the Code Committee of the A.I.A., the other members being Frederick Mathesius, Jr., Wm. G. Nolting, Horace W. Peaslee and Francis P. Sullivan.

HOUSING RESEARCH IN PHILADELPHIA

Photo-crafters

By BERNARD J. NEWMAN
Director, Philadelphia Housing Association

It is impossible to find correlated information about housing conditions and needs in American municipalities. No federal bureau possesses it, nor does any national organization. Forecasts of future housing needs are mostly assumptions, which may be successfully challenged on grounds of inaccuracy. Hence, the fallacy of many housing programs and the wide variance of belief as to what constitutes sound housing policy.

There is a striking similarity of housing defects in town and city. Unsafe and insanitary conditions vary in degree but not in kind. Faulty planning practices, faulty construction methods, blighted areas and slums are found practically everywhere. But the housing problem is not determined by conditions so much as by causes which lie back of them. These causes include the faulty economic policy and practice of those to whom housing is a commodity, as well as the short-sighted engineering service of local governments which projects public improvements without taking into consideration their beneficial or harmful effect upon home environments.

The lack of a factual basis for policy framing and programming, and the unwillingness to make any critical analysis of available factual information in the rush to take advantage of a market for housing, or to find an outlet for unused capital, was strikingly illustrated during the past decade. The rule of thumb method which governed both builder and banker seemed to be plan, finance, build, sell. If the projects failed, it was just too bad; the projectors expected to shed responsibility when buyers took the structures off their hands, but neither they nor their victims escaped, and the oversupply of high-priced dwellings was followed by sheriff sales.

Factual evidence of the need for and of the resources of the public to absorb a housing supply, would have deterred such overbuilding and in turn would have strengthened the position of both buyer and mortgagee. Stability in the construction and mortgage fields is vital to the economic life of the nation.

Moreover, a factual basis for the determination of plot subdivisions and of the types of dwellings best suited to the social and economic life of a community would have guided the development of streets and structures and so prevented confusion in normal city growth, with the resultant obsolescence and deterioration of areas and city slums. Nowhere in the literature of housing is there any satisfactory study of dwelling types which includes architectural expression, social needs of families, hygienic values and economic consequences. True, the President's Conference on Home Building and Home Ownership did present phases of the problem among the many subjects it analyzed. But, necessarily, it was more of an editorial presentation than a factual study. It gave the opinions of a group rather than deductions and correlations from carefully assembled data. These are examples only of the inherent fallacy back of the many proposals being made today for meeting the housing problem.

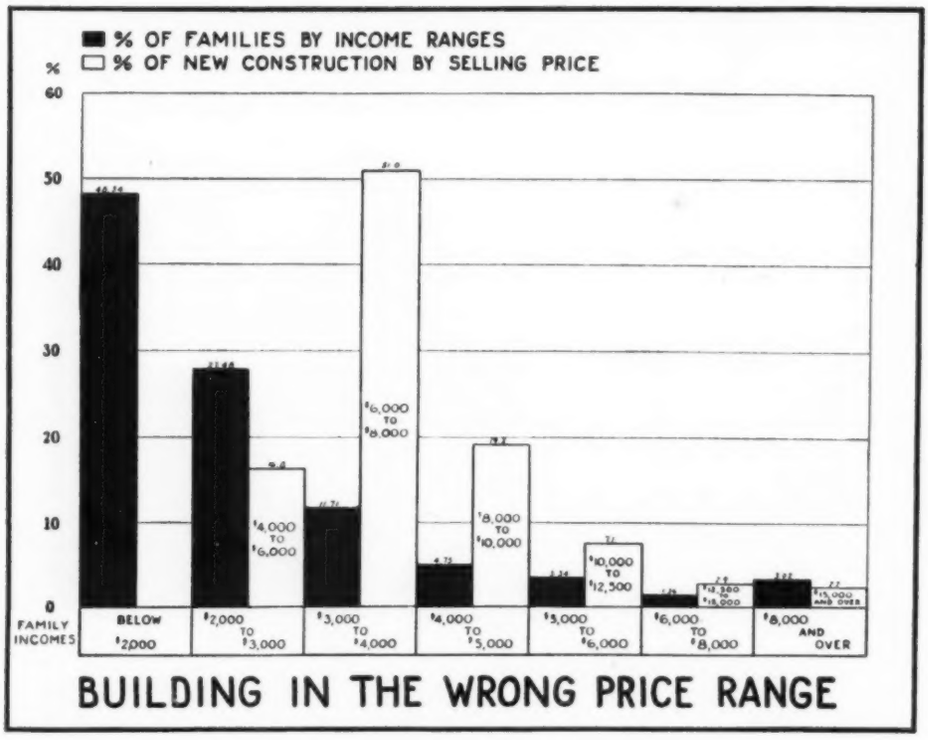
If there is any underlying philosophy to the work of the Philadelphia Housing Association, and we who have the pleasure of working with this Association believe there is such a philosophy, it is that progress toward better housing is conditioned upon the accumulation, correlation and interpretation of the facts and factors that relate to housing betterment.

The studies of the Philadelphia Housing Association, undertaken primarily in the interest of better homes for the lower-income groups, have been so selective in design and thorough in execution as to command attention from land economists, city planners and business men as well as from housing specialists. They prove, among other things, that the current economic depression is not exclusively responsible for the distress of home owners, investment owners and mortgagees, because the distress became acute in Philadelphia as far back as 1925.

Fairchild Aerial Surveys, Inc.

While the Association has long recognized the need for fact-finding in co-related fields, its work has been handicapped by inadequate financing, which has forced it to coordinate its studies with those of other organizations instead of mapping out its own comprehensive program. Where there is a division of responsibility in assembling of facts, gaps necessarily interfere with that refinement of correlation which alone can give an accurate picture of the problem and the program essential to meet it.

In 1923 the Association definitely challenged current building programs only to have its judgment condemned by the building operators and their financial backers. The sales price of the large majority of new houses at that time was more than $7,500. The Association insisted that this price range was beyond the buying power capacity of those who were in the market for housing; that structures provided in this range could only be sold under compulsion of high rentals and a housing shortage; that the fees charged for



BUILDING IN THE WRONG PRICE RANGE

construction loans and the profits demanded by the builders caused too great a spread between construction costs and sales prices.

In an attempt to check this over-extension of high-priced housing the Association assembled data and made surveys of the potential housing needs for the normal population increase. These surveys, covering a decade, included an analysis of population growth; population distribution by income ranges; the conversion of dwellings to multiple uses; the amount of new construction; demolitions; vacancies by price range, types and districts; rents and rental increases, also by districts. Later on studies were made on the amount of distressed ownership as evidenced by sheriff sales and evictions. Into this picture there necessarily came studies of transit extension and needs; the adequacy of utility expansion, both commercial and governmental; the suitability of areas for development, types of housing and their economic reaction upon land values and assessments. Supplementary studies were made to determine the resistance of owners to maintenance programs on rental properties, the amount of overcrowding and doubling-up of the population, special studies of blighted areas and other similar material which were essential in order to assemble all the factors which influence the situation.

When these studies were correlated it was found that the estimated population increase, based on population growth of preceding decades, was an unreliable figure upon which to determine the need for dwelling accommodations. Population was not increasing as rapidly as it had been, yet the complexion of the population was changing. This was important because a reduction in annual growth definitely affected the amount of dwellings needed. Every other agency in the city estimating the growth of the city challenged these findings, but the 1930 census confirmed the figures of the Association.

These studies also showed that the area of blight was rapidly spreading from the old city areas to contiguous sections and that new dwelling construction, concentrated to an abnormal extent in certain defined districts, was draining population from the older areas. At the same time the vacancy studies for a period of years showed a decrease in the number of available accommodations.

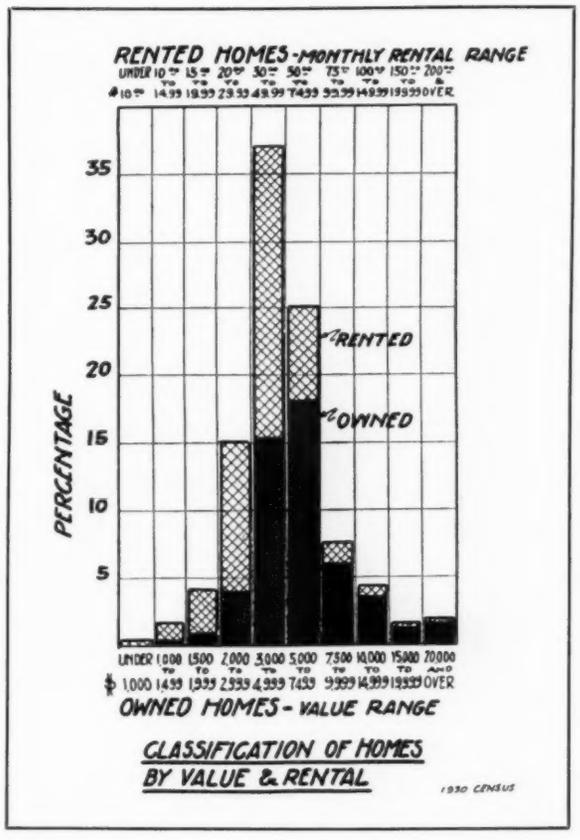
The conversion of dwellings was rapidly increasing during the first half of the decade; it was more pronounced in the wards bordering the old areas of prior population loss. These conversions were adding a sizable number of new family accommodations to help relieve the housing shortage and, of course, to compete with new construction for the expansion of households.

The demolition surveys showed several important trends. Many dwellings were being torn down; the areas cleared were being used for public improvements and commercial and industrial development or expansion rather than for housing, indicating that there would undoubtedly be created an oversupply of such structures when the abnormal prosperity swing ceased and the inevitable recession in demand set in. But at no time during the decade was there any evidence of an oversupply in the total amount of new dwelling accommodations, although there was evidence, supported by subsequent studies of the Association, of an over-supply of accommodations in certain sales price as well as rental ranges.

The studies made of each year's new housing construction showed a very small percentage of accommodations during the first half of the decade in houses selling for less than $6,000. The bulk of the construction was at $7,000 and over. Manifestly, in an industrial city like Philadelphia, notwithstanding the high wages paid in some of the trades, the bulk of the population could not afford to either rent or buy homes at such prices. When the Cawl Buying Power Survey was made, and the Association was finally able to check the income ranges of the population against the sales price ranges of new housing, it was apparent that distress was in store for many purchasers of new housing.

The surveys of new construction also furnished supplementary information as to the period of absorption of new housing, the areas of concentration, the reasons why some operations were sold more readily than others, and the explanation for the increase in apartment construction. For example, the rapid increase in apartments during the decade was brought about by the need for an outlet for capital, high land values, and the desire of the owners of the land to erect income-producing structures. The expansion of this type while more pronounced during the decade was not a steady trend toward apartment living but the recurrence of a cycle in such building which had started and receded in the two preceding decades. Moreover, the slow absorption of apartment accommodations showed that the trend had overshot itself; that the people of Philadelphia were not accustomed to apartments; and that only a small percentage of the population wanted to live in them. The excessive vacancy rate in apartments today, about 35% as compared with less than 4% vacancy in dwellings, the financial difficulties of the owners as well as the mortgagees, is only added evidence of the futility of trying to force an outlet for funds in a type of construction unwanted by the people.

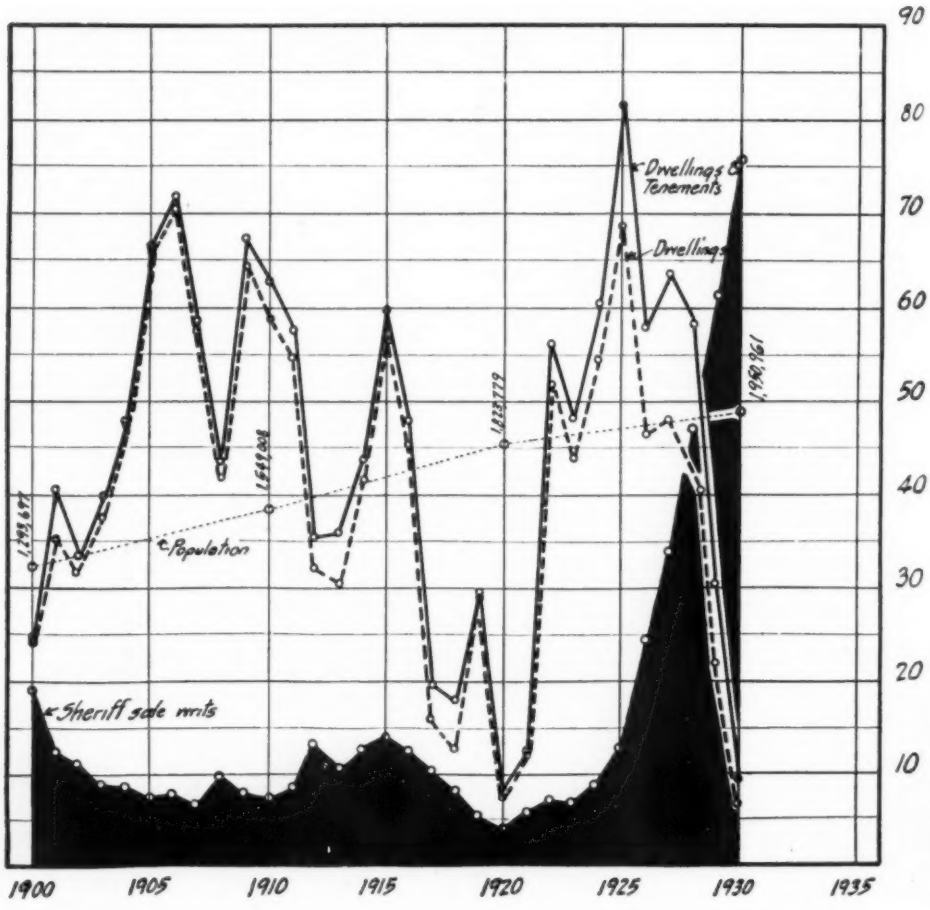
Philadelphia like many other cities has been misled by certain groups of builders and their financial backers into believing that city expansion always means new sources of revenue. This argument has been advanced to justify utility extension, more sewers, water mains and transit facilities, paving and grading for the outlying sections in order to make land available for building operations. Of course, when housing is needed these services must be provided, even in new areas, although they may be unprofitable to the city. However, orderly expansion is an essential to economy of government. Surveys of new construction in relation to tax returns showed that extension of these services without a plan for control over the types of housing and the location of the areas of development actually resulted in a definite loss to the city. The return from taxes checked against the per capita cost of government from some areas was a debit charge because there were wide stretches of territory equipped with utility services which were not being utilized for housing or other



construction uses. It was also found that often housing operations would neither sell nor rent at the extremes of such unused areas. Both the builders and the city lost as a result. Thus an anomalous situation was revealed. The city center was equipped with utility services which, due to a declining population, were incompletely used, and new areas expanded with the aid of city funds were operating at a loss, both areas combining to increase municipal governmental costs at the expense of taxpayers all over the city.

Necessarily this statement is only a sketchy outline of the survey work carried on by the Philadelphia Housing Association. Many of the studies seem unrelated while as a matter of fact they are all interdependent. They expose unsupported theories and reveal injurious factors in current social and economic housing practices. All the major fields of study in which the Association has worked during the past decade have not been discussed, but one of great significance, the sheriff sale situation, should be introduced.

It is generally assumed throughout the country, and it has been so stated in Philadelphia, that the distress of home owners, investment owners, and mortgagees, so pronounced today, is directly attributable to the economic depression. The severity of the distress may be, but in so far as Philadelphia is concerned the major cause appeared prior to the depression. The records of sheriff sales for a period of thirty years show that property owners became acutely distressed in 1925. During the



Number of dwellings and family accommodations provided by new construction, and number of sheriff writs, per 10,000 population, during last thirty years.

years of the so-called Coolidge prosperity, the curve of sheriff sales mounted rapidly. In 1920 sheriff writs amounted to less than five per ten thousand population. In 1928, a year before the market broke, sheriff writs had risen to almost 50, and in 1929 to more than 60 per ten thousand population. The significant fact is that all types of houses, new and old, were distressed. Analysts of real estate abnormalities have written volumes about speculative land booms in localized areas throughout the country. But it has seldom been noted that similar booms occurred during the past decade in our large cities and the resultant crash has been a decisive factor in the sharp drop of values in all types of investments and commodities. It was no fault of the Housing Association that this crash was not prevented in Philadelphia for its studies and publications gave every evidence of the inevitability of the result. That it might have been worse if many builders and their financial backers had not taken the warning of the Association in 1926 and 1927 is pretty well established.

These citations of the studies made by the Philadelphia Housing Association, necessarily briefly described here, illustrate in a sketchy way what has already been said, namely that the Association believes that progress in the housing field can come only through critical analysis of conditions and a determination of the causes responsible for them. In much of its work in this field the Association has been pioneering. It is not seeking facts as such. Thus it is not satisfied when making a vacancy survey merely to know the percentage of vacancy, but it determines the areas and length of vacancy, the size and types of houses vacant, their condition, the rental groups in which vacancies are most pronounced, etc. It is a waste of funds to determine a vacancy rate unless at the same time information is acquired which will explain the cause of the vacancy and the handicaps under which owners are operating and which, if removed, can practically assure them of tenants. Each separate study is as thoroughly analyzed with the result that the findings of all may be closely correlated.

Reports are not published in detailed form, but detailed information is on file and available for consultation in the office of the Association. The conclusions reached always find easy entrance to the columns of the Philadelphia papers, and the consultation service thus built up brings to the Association's offices many representatives from local business houses to whom such information is of value. Considerable correspondence is finding its way into the office in consequence of these press releases and through inquiries made to other city organizations. This puts a heavy burden of work on the staff but if its pioneering work in this field helps to stir other groups in other cities to require more accurate information about their home conditions, perhaps the extra labor entailed is not wasted.

METROPOLITAN LIFE INSURANCE COMPANY

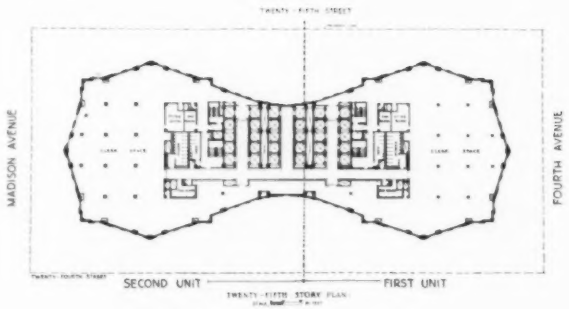
NEW HOME OFFICE BUILDING IN NEW YORK

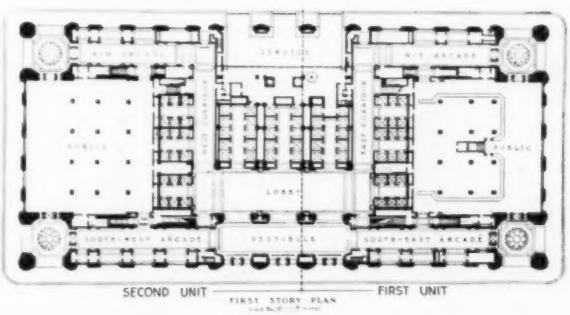
D. EVERETT WAID and
HARVEY WILEY CORBETT
Associated Architects

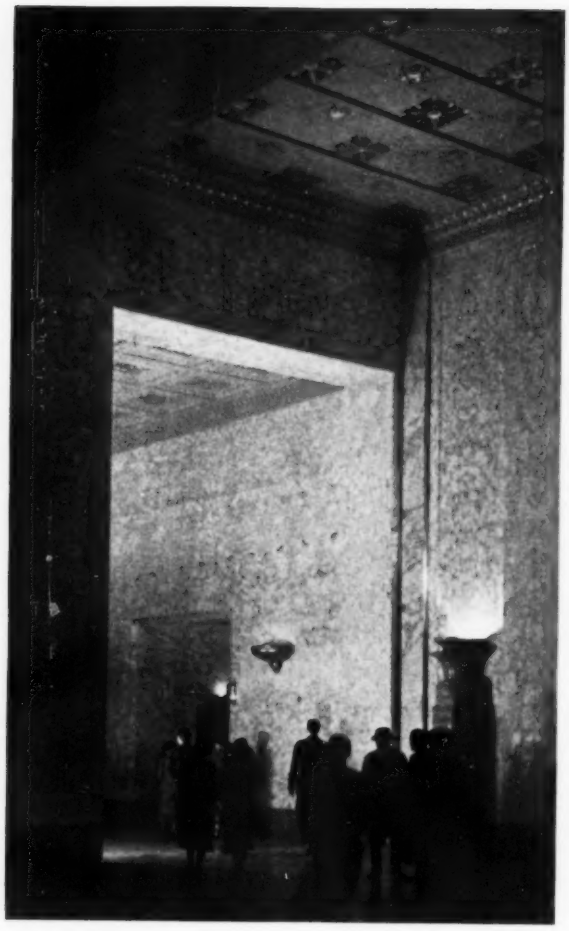
The new home office building for the Metropolitan Life Insurance Company is in no sense "just another building." It could not be characterized, despite its title, as an office building although it contains offices. It could hardly be called a factory although Mr. Ecker, the president of the company, sometimes refers to it as such. It could not be classified as a loft building although it contains many spaces which are in the nature of lofts. It could hardly be thought of as a restaurant although it feeds 8,000 persons daily, prepares meals for over 12,000 and has a kitchen plant capacity of 25,000. It is not yet a completed building, having been planned initially to cover the entire block between Twenty-fourth and Twenty-fifth Streets, Madison Avenue and Fourth Avenue, in New York City; it now covers only the eastern half of this block. It is not a public building except in a minor sense. It is not a show building from the general public's point of view. In fact, it is *a highly specialized building designed primarily as a machine to do as efficiently as possible the particular headquarters' work of our largest insurance company.*

The owners desired adequate working conditions, structural permanence and a cleanliness of aspect which would key with their recognized policy of health, happiness and well-being for their vast staff of employees, a very large percentage of whom are women. The limitations placed upon the architects by the necessity of creating at the present time only half of an ultimately unified building and yet making the present structure a completed working unit; the restrictions of the city's zoning ordinance controlling permissible bulk; the introduction of the latest ideas in ventilation, air conditioning, sound deadening, artificial lighting, intercommunicating pneumatic tubes, telephones, call bells, unit operating clock systems, special elevator and escalator installations to meet on a staggered time schedule the enormous flow of employees, the serving of meals at noon each working day to all of these employees, the receiving and distribution of many truckloads of mail, and many other technical operating problems—all of these were factors influencing plan and design.

HARVEY WILEY CORBETT





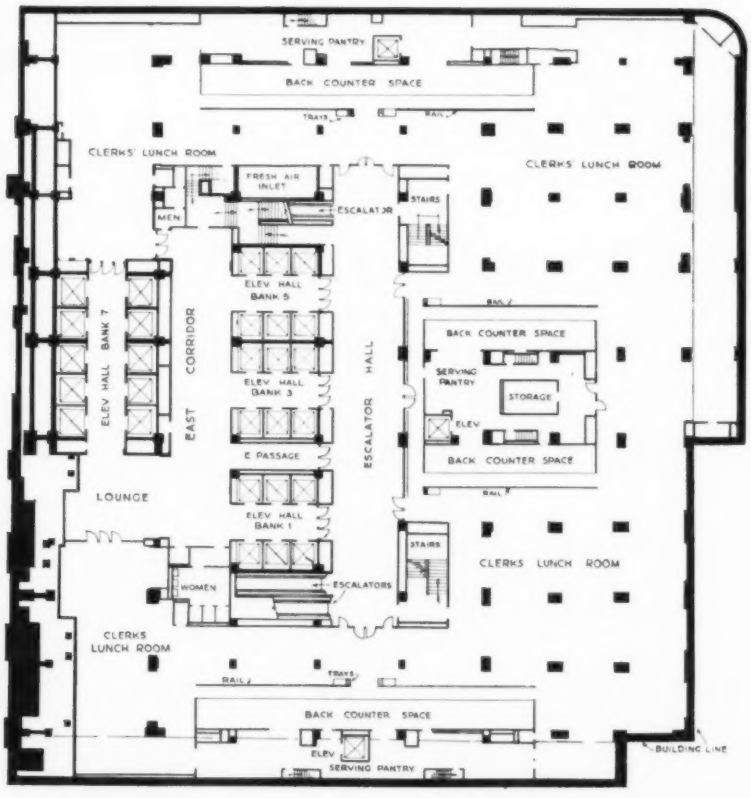


Sigurd Fischer

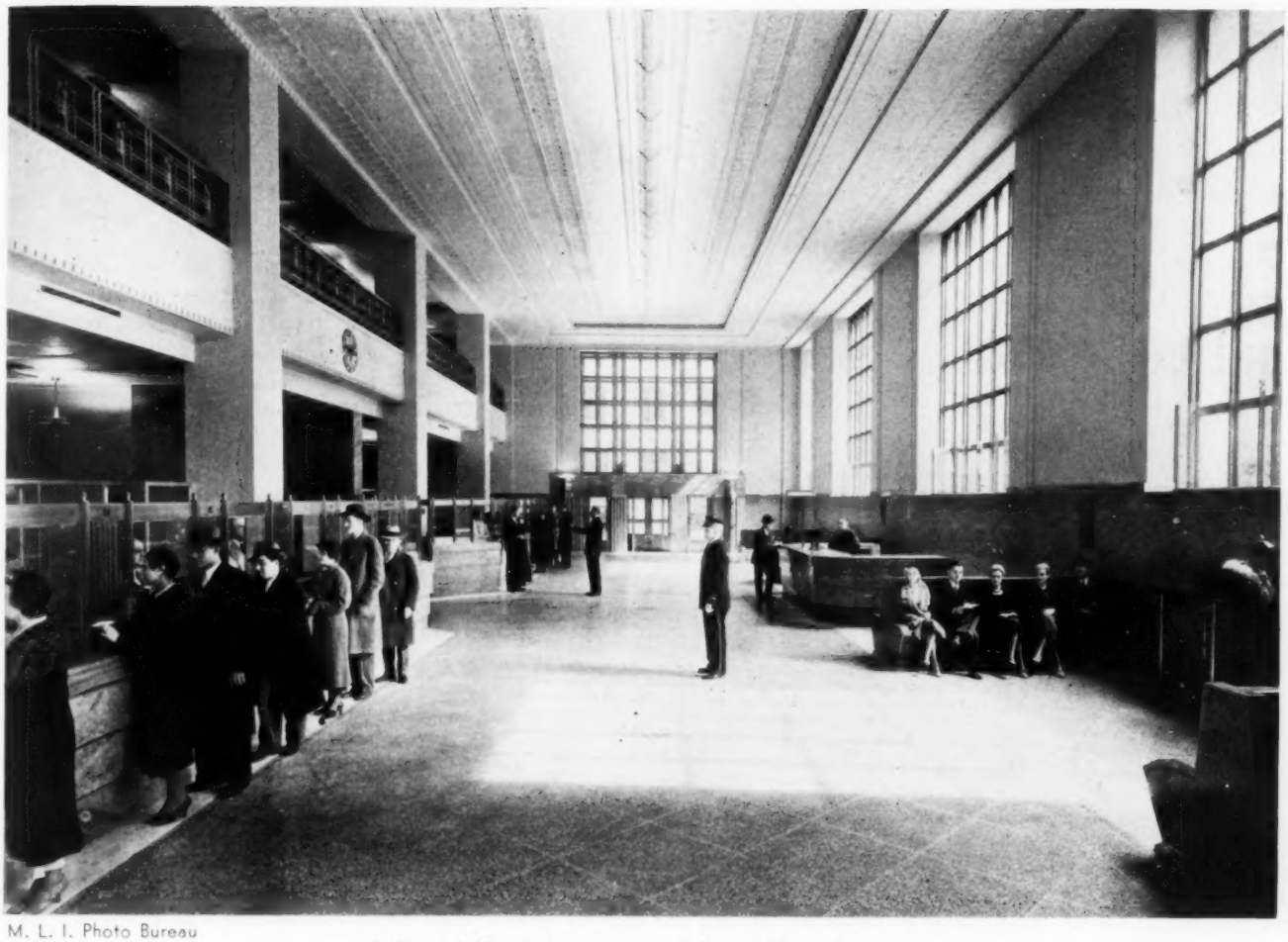
Views of Corridors on Ground Floor

METROPOLITAN LIFE INSURANCE CO.
HOME OFFICE BUILDING IN NEW YORK

D. EVERETT WAID
HARVEY W. CORBETT
ASSOCIATED ARCHITECTS



Second Basement Plan



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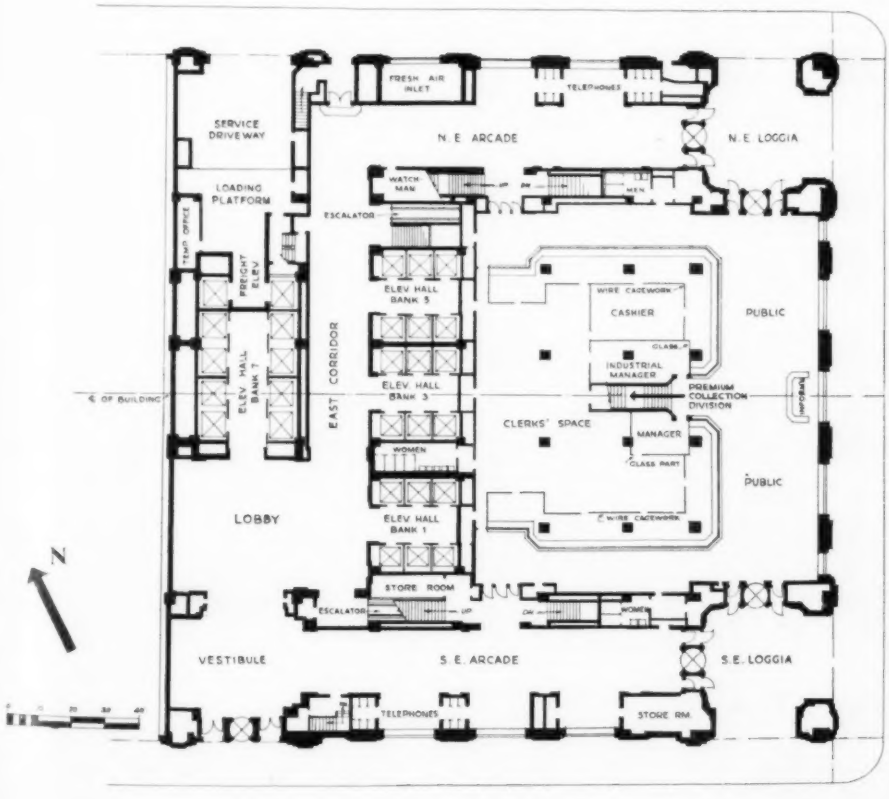
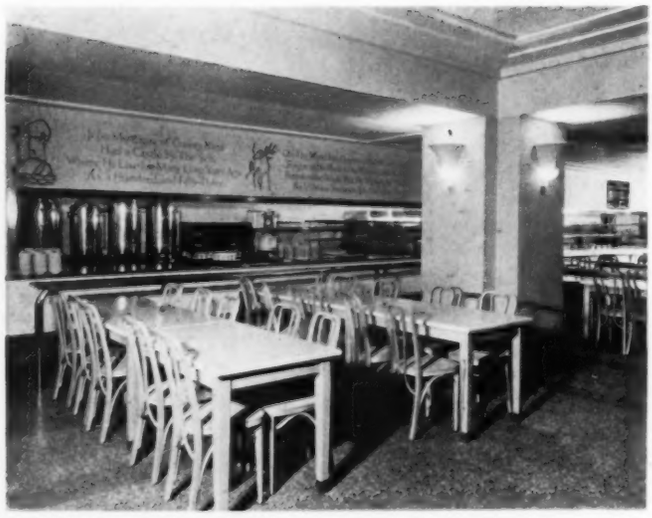
Policy Holders' Premiums and Loans Department



METROPOLITAN LIFE INSURANCE CO.
HOME OFFICE BUILDING IN NEW YORK

D. EVERETT WAID
HARVEY W. CORBETT
ASSOCIATED ARCHITECTS

Ground Floor Plan



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Views of Lunch Room and Lounge

METROPOLITAN LIFE NEW HOME OFFICE

D. EVERETT WAID and Associated

The chief architectural points of interest lie in the unusual form of the building exterior, the great arcades and public spaces at the street level, the restaurants and lounge rooms in the second and third basements below the street level and the large assembly room and gymnasium on the 27th floor.

The major portion of the building space is used for clerks who work in large groups under the supervision of a group manager. The ordinary normal office depth of 27 to 30 feet from the outer wall was not sufficient. The problem in space arrangement required the largest bulk of building which the restrictions of the zoning ordinances would permit. The first step in design was therefore to determine the possible "envelope" by taking full advantage of the "dormer permit" and then to arrange the setbacks so as to gain every possible foot of floor area consistent with structural economy. The form of the building in its upper stories is the result. It is not merely a striving on the part of the designers for a peculiar or bizarre architectural effect.

The arcades and lobbies on the main floor are generously planned for width and height and have the aspect of a public building, but the general public is not drawn to this building except through curiosity. The reason for planning the ground floor on what appears to be so monumental a scale was to provide adequate circulation facilities for the vast working population in the building itself. Since this building has a daily population of over 8,000 and in its completed form will contain a working population of over 25,000, space must be provided on the ground floor to meet this flow adequately. The employees are taken by elevators from the different departments throughout the building to the dining rooms in the second and third basements, returning after luncheon to the main floor by means of escalators. This allows the elevator system to operate local and express service starting always at the main floor. The employees

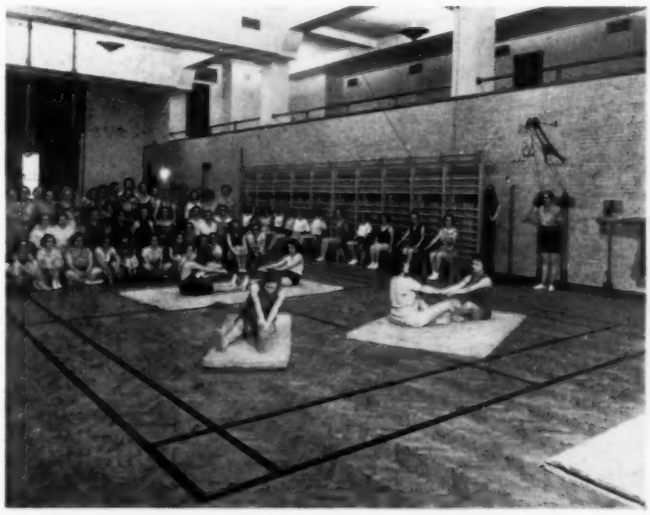
make use of the remaining time of their luncheon recess to promenade through these lobbies and in pleasant weather to go outdoors in the great corner loggias or on the sidewalks surrounding the building. Store fronts were not required at street line since there are no shops in the building. The arcades were placed parallel to the sidewalks so that all portions of the lower floor are naturally lighted, a feature which is unusually pleasant compared with most city buildings.

Above the ground floor are four floors of filing space where natural light was not as necessary as in the other floors. This gave the architects an opportunity to treat the lower portions of the building as a mass of masonry that adds materially to its monumental aspect.

The restaurants in the second and third basements are unique features not only in their size and plan arrangement but in the scheme of decoration. The desire was to provide a dining space which would not carry the impression of being far under ground, but would be as attractive as possible. These spaces are treated simply and architecturally. The necessary plainness of the walls is relieved by murals which are handled in a manner to retain the sense of wall surface and yet add an air of gaiety and light which would interest and amuse the diners. Conditioned air or "manufactured weather" makes this a very pleasant space at all seasons.

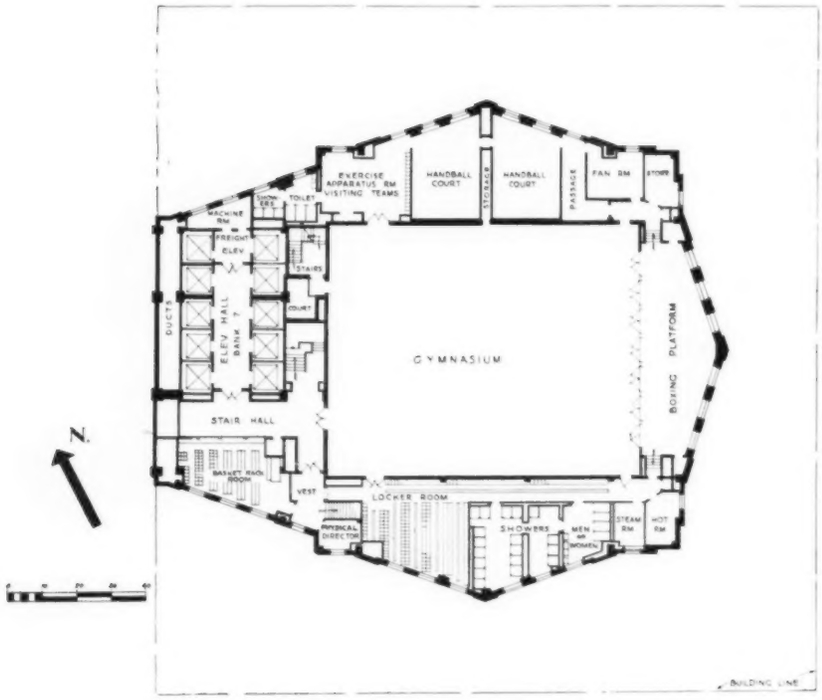
On the twenty-seventh floor is an auditorium which occupies the entire top story. It is used as a meeting place for company managers and agents in their various conventions and also for various conferences and gatherings necessary for transacting company business. Complete motion picture equipment and stage is provided, in addition to a gallery. The space serves also as a gymnasium for company employees outside of business hours.

The building has a floor space of more than twenty-three acres.

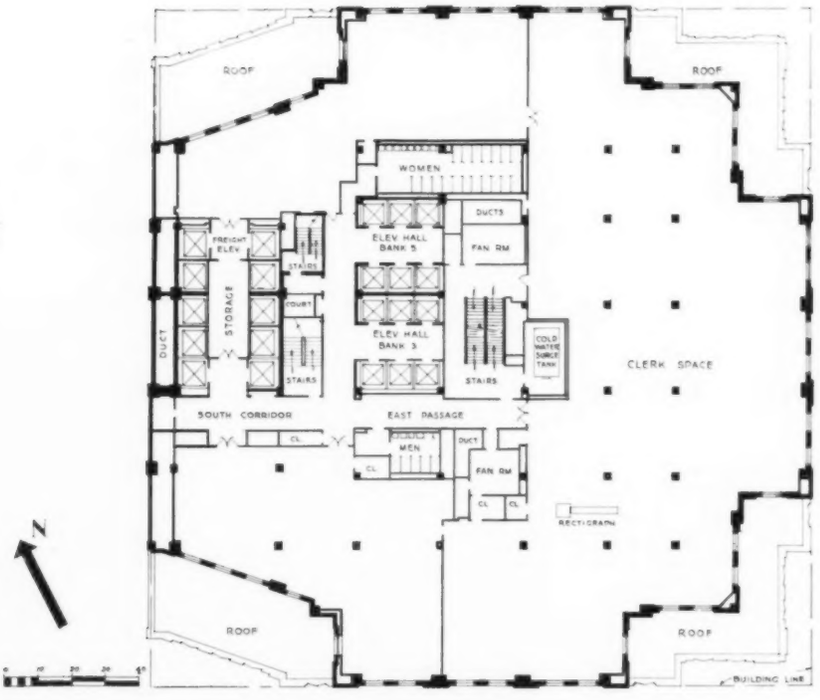


M. L. I. Photo Bureau

Views of the Gymnasium



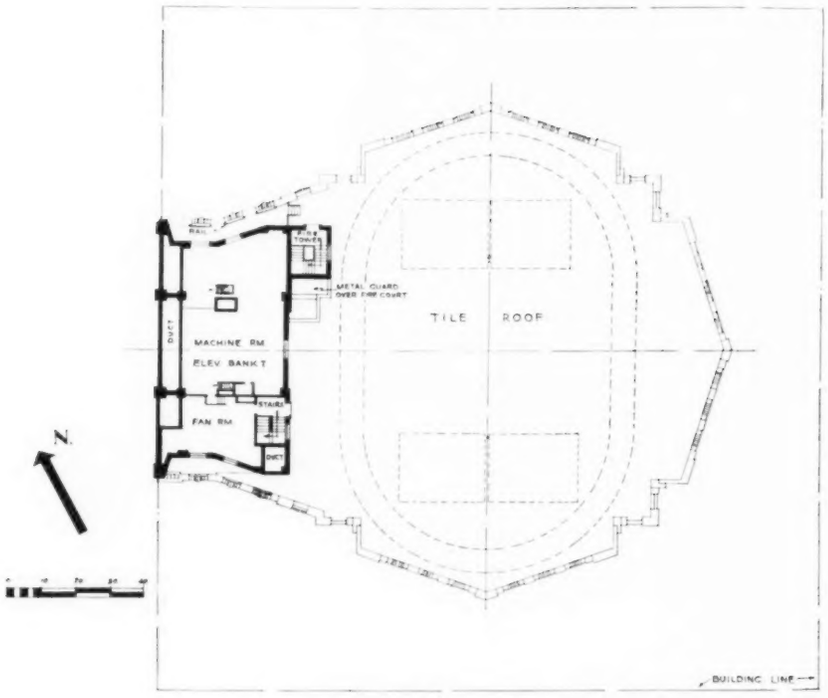
Plan of Twenty-Seventh Floor



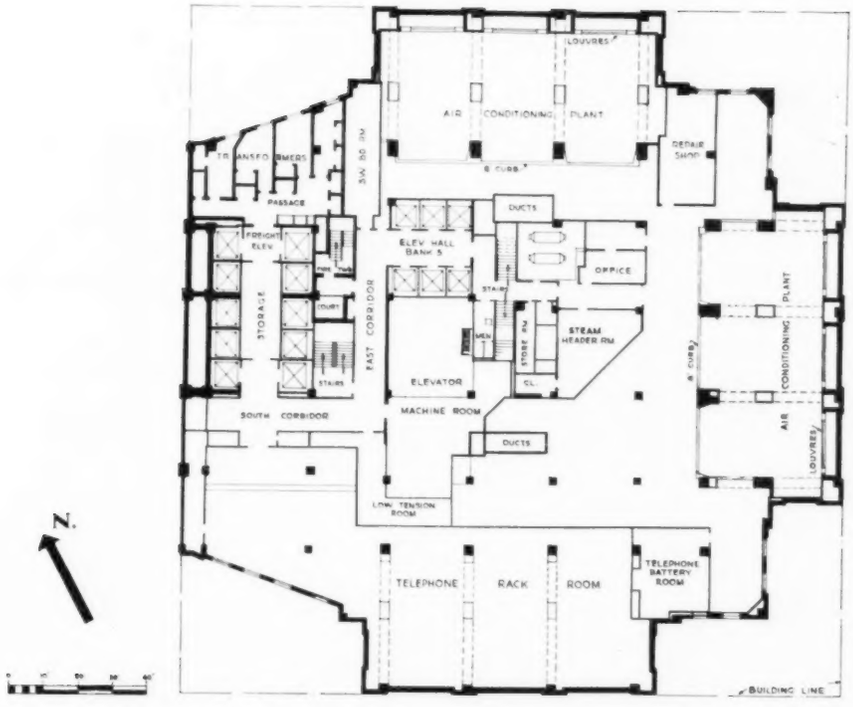
Plan of Thirteenth Floor

HOME OFFICE BUILDING
METROPOLITAN LIFE INSURANCE COMPANY
IN NEW YORK

D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS



Plan of Roof

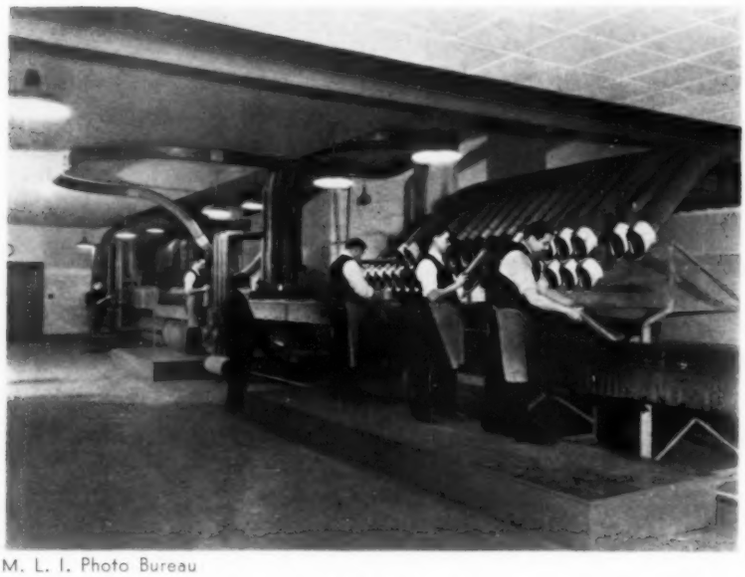


Plan of Fifteenth Floor

METROPOLITAN LIFE INSURANCE COMPANY
HOME OFFICE BUILDING
IN NEW YORK

D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS

One of the Laboratories



M. L. I. Photo Bureau

Pneumatic Tube System

FEATURES IN THE NEW HOME OFFICE BUILDING METROPOLITAN LIFE INSURANCE CO.

One year assigned for study of sketches, models, and for tabulation of calculations on elevators, capacity in clerk areas, cubic contents, and costs.

Designs were studied for buildings ranging from 30 to 100 stories. Design adopted—30 stories for east unit. Height of west unit undetermined.

Plan of first story—general public space. Scheme of upper stories—elevators, stairs, toilet rooms, in center. A factory for insurance work. All outside windows light working space.

Exterior design—zoning law setbacks. Stone. Bronze windows.

No boiler room or smoke stack. Electric current for light and power. Mechanical plant still extensive—fourth basement and fifteenth story. Heating—automatic control of temperature. Air conditioning for entire clerk space regulates humidity and cools air in summer.

Electric light—semi-indirect; glare avoided.

Time clock system with master clock controlling program bells signals all clerks in the building at alternating periods. Telautograph sends written messages instantaneously.

Central automatic station—telephones throughout the building with desk signal calls from executives to assistants.

Automatic silent fire alarm reports exact location of smallest fire and calls a private fire brigade to any part of the building, ready to check a panic which might result from a trifling cause. Brigade of trained men among the regular mechanics and porters of the building. Fire pump—delivery 750 gallons per minute above top of building.

Pneumatic tube systems—capable of carrying policies, documents and mail from all parts of building to a central station, thence to any other part.

Private Laboratory of Director

M. L. I. Photo Bureau

Soup Kettles in Main Kitchen

By D. EVERETT WAID, Architect
HARVEY WILEY CORBETT, Associate

Filing cases in six tiers, for stationery and supplies, policies and the like, occupy three entire stories. Vertical automatic conveyors for rapid transfers.

Plumbing fixtures with sanitary features unusual even in public buildings. Lavatories without stoppers—a gentle spray permits washing in running water. Water closets and urinals flushed by foot control.

Photographic machines—capable of making facsimile copies of policies and documents at the rate of 7,000,000 a year.

Gymnasium—thousands of employees in rotation may exercise with varied apparatus, including basketball and handball facilities; 1,200 folding chairs disappear under a platform which on occasion may be used for boxing, lectures, concerts or dramatic events and motion pictures.

Acoustical ceilings—used throughout clerk spaces and in dining rooms to soften hundreds of clicking machines and noise of dishes.

Dining rooms in the second and third basements. Luncheon given free to employees by self-service system. The kitchen in the first basement prepares the food for 14,000 luncheons served in 2½ hours each day. This kitchen will provide for 25,000 clerks when the second building unit makes that demand upon it. A row of 10 kettles with capacity for 2,000 gallons of soup; bake ovens, cold storage and other equipment to correspond.

Freight system—six 10-ton trucks can stand at the receiving and shipping platform inside the building to care for mail, printed matter, food supplies, garbage and waste.

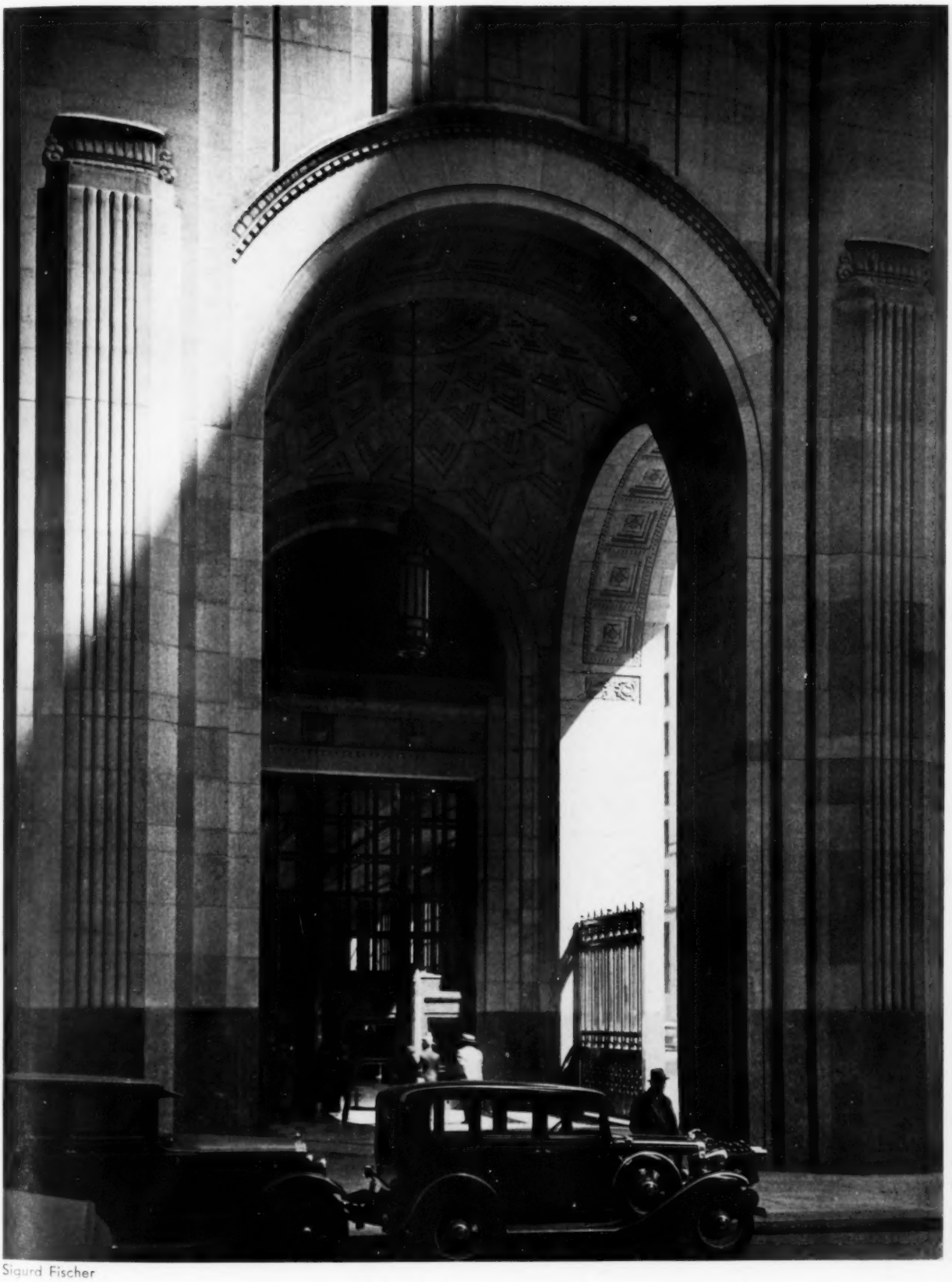
Water consumption—over 300,000 gallons a day.

Building contains 15,000,000 cubic feet.

Sigurd Fischer

East Side of Building Showing Southeast Loggia Entrance

HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK
D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS



Sigurd Fischer

Detail of Loggia Entrance

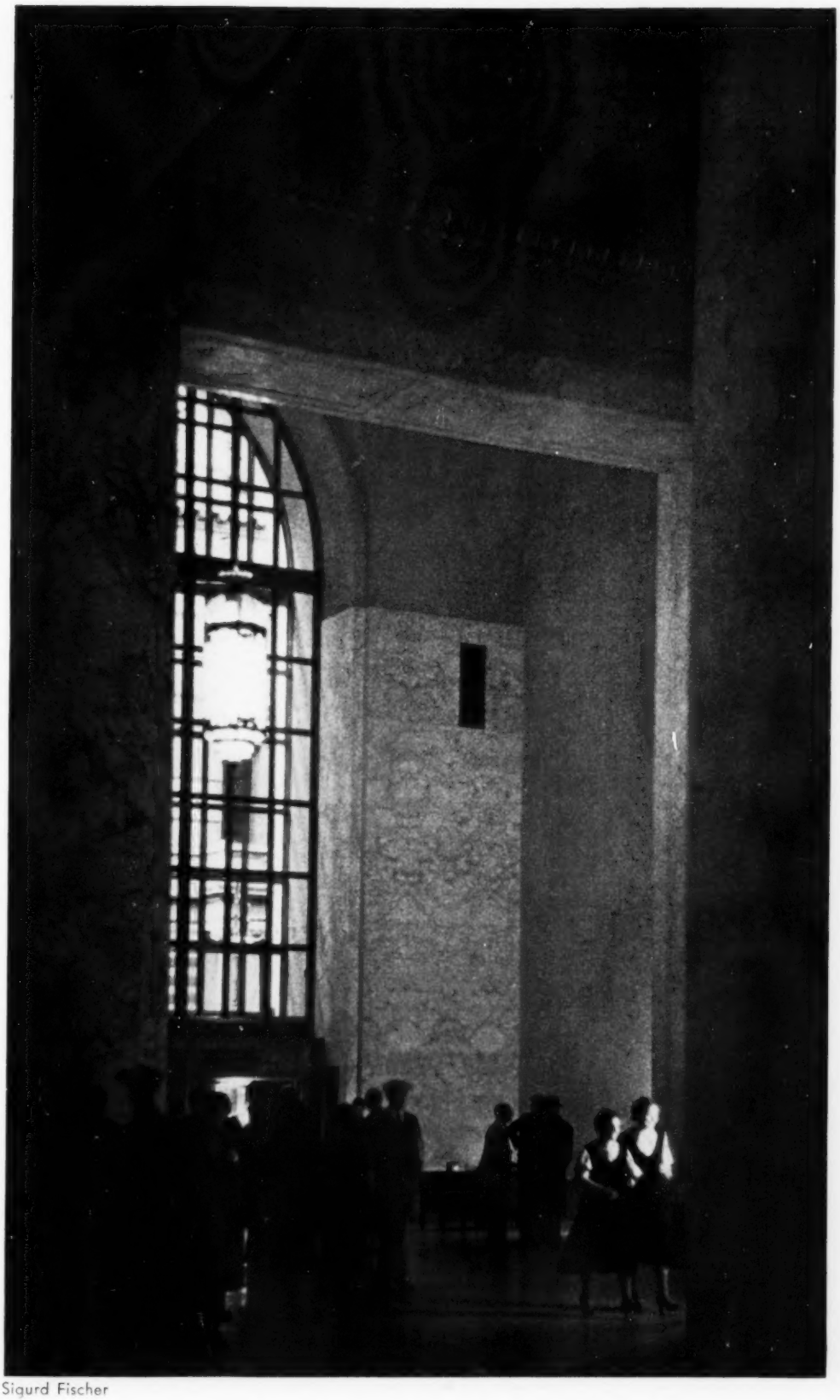
HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK
D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS

Sigurd Fischer

View Looking West on East Twenty-fourth Street

HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY, NEW YORK

D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS



Sigurd Fischer

Twenty-Fourth Street Entrance Vestibule Seen from East Corridor

HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK
D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS

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Second Basement Lounge

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Premium Collection Division on Ground Floor

HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK
D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS

Sigurd Fischer

Silver and Buff Ceiling in First Floor Corridor

HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK
D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS

Sigurd Fischer

Ceiling of Southeast Arcade—Walls of Italian Cremo Marble

HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK
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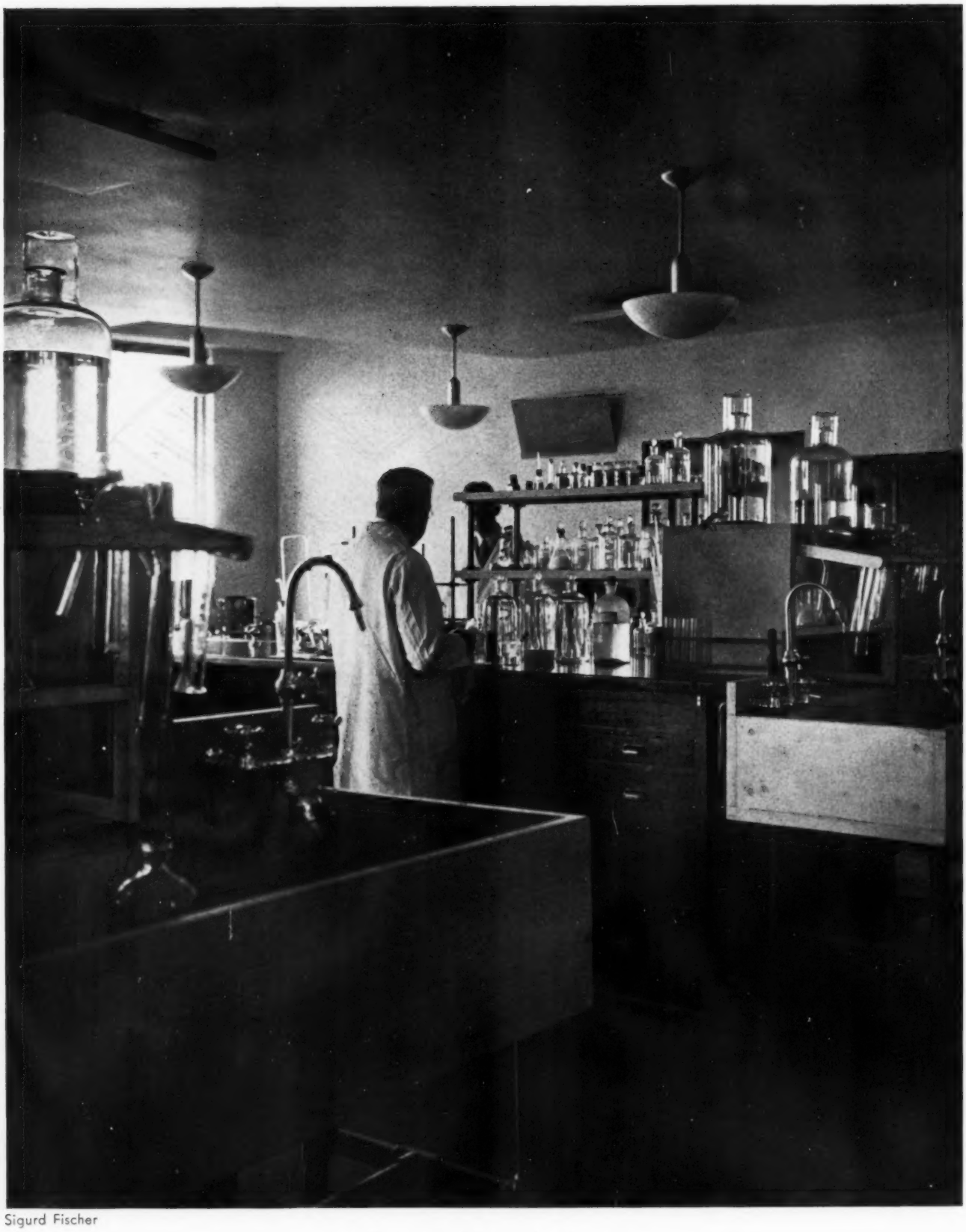

Sigurd Fischer

A Testing and Research Laboratory

HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK
D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS

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Interview Booths in Inquiry and Public Loan Bureau on First Floor Mezzanine

HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK
D. EVERETT WAID AND HARVEY WILEY CORBETT, ASSOCIATED ARCHITECTS

Sigurd Fischer

Noontime in One of the Employees' Lunch Rooms

M. L. I. Photo Bureau

"Wild Life"—Mural in Lunch Room Lobby

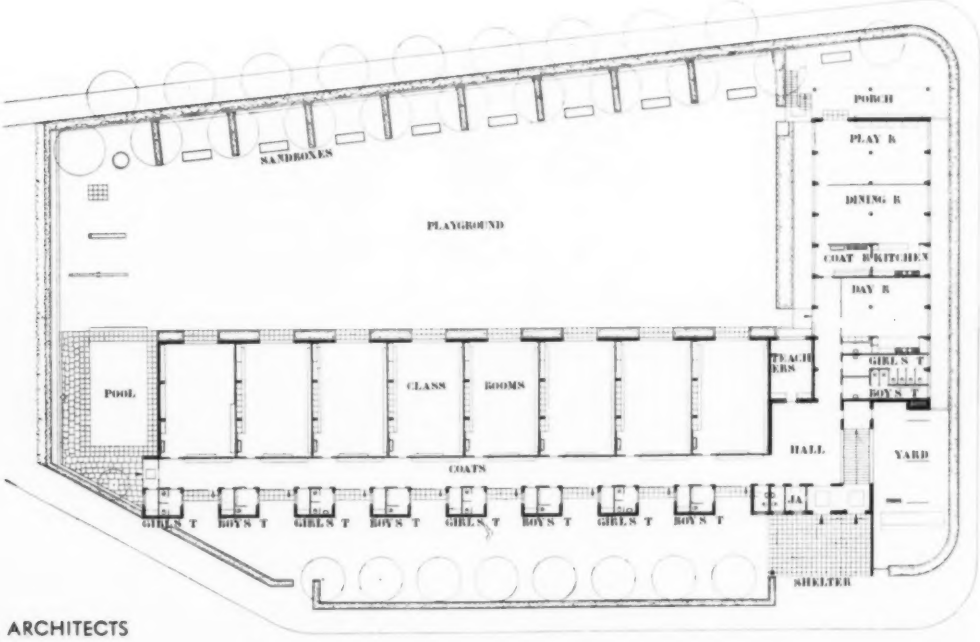
HOME OFFICE BUILDING OF METROPOLITAN LIFE INSURANCE COMPANY IN NEW YORK

D. EVERETT WAID AND HARVEY W. CORBETT, ASSOCIATED ARCHITECTS

General Views of Kindergarten and Playground from the South

KINDERGARTEN IN ZURICH-WIEDIKON, SWITZERLAND—KELLERMULLER & HOFMANN, ARCHITECTS

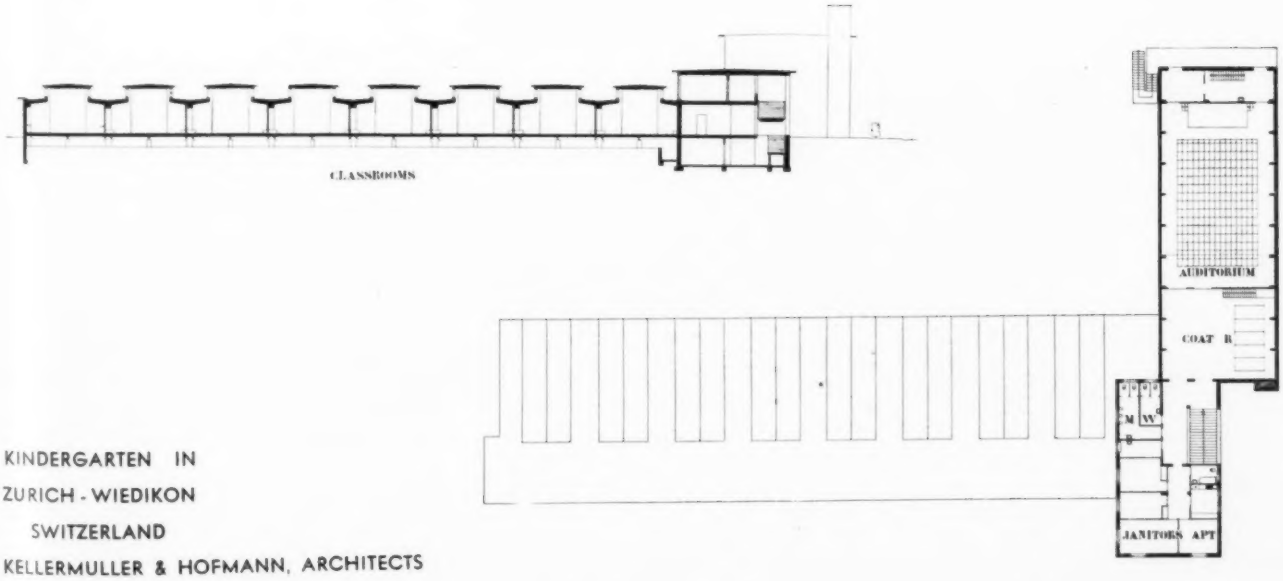
Interior of Classroom Looking Towards Playground



KINDERGARTEN IN
ZURICH - WIEDIKON
SWITZERLAND

KELLERMULLER & HOFMANN, ARCHITECTS

Classrooms are Equipped with Sliding Doors of Glass



KINDERGARTEN IN
ZURICH - WIEDIKON
SWITZERLAND
KELLERMULLER & HOFMANN, ARCHITECTS

KINDERGARTEN IN ZURICH-WIEDIKON, SWITZERLAND

KELLERMULLER & HOFMANN ARCHITECTS

Eight classrooms, day and playrooms, are combined in a single building because of scarcity of land in the densely populated section of the city where the Kindergarten is located. Children come to the school within a radius of one-third mile.

The lighting of the classrooms is shadowless. This has been obtained by overhead windows which receive sunlight all day long.

At the same time this type of window allows cross ventilation.

All classrooms open directly on the playground by means of horizontally sliding glass doors.

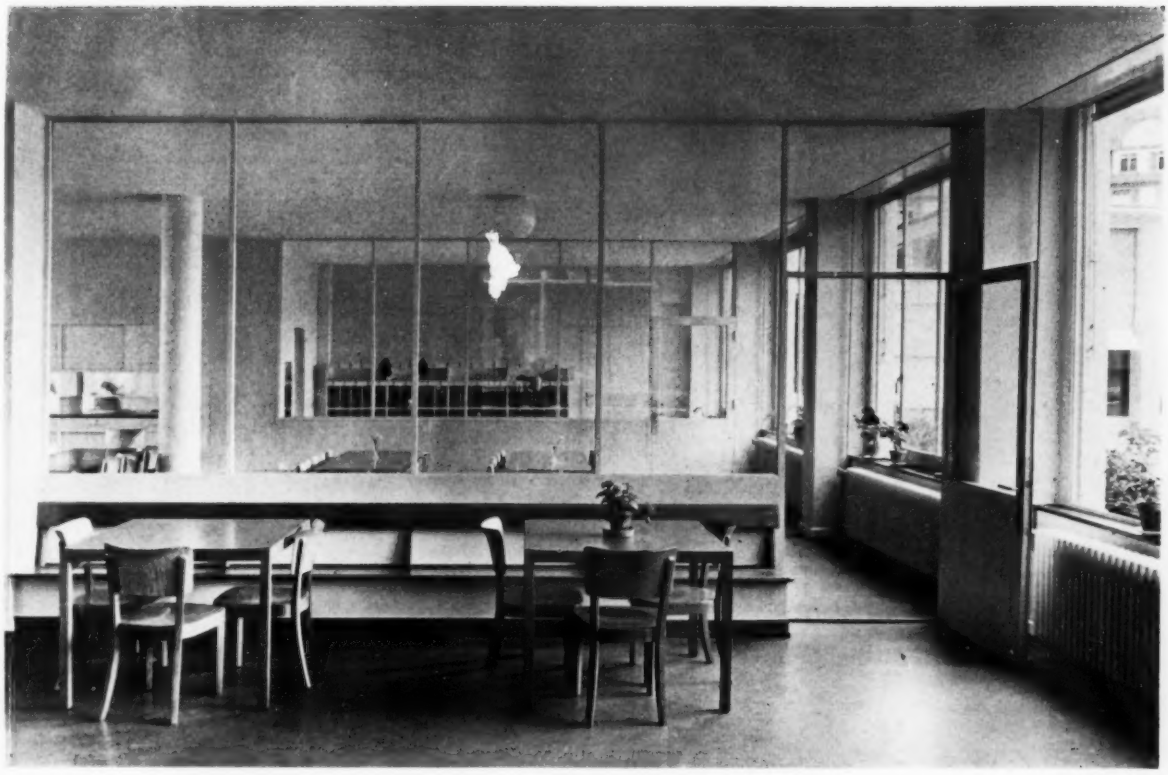
Cabinets and drawers for working materials are built in. There is ample wall space for blackboards and pictures. Special care had to be observed for good floor insulation. As there was no demand for a basement, an air space between ground and floor beams avoids conduction of dampness. The flooring is linoleum.

Each classroom has a direct entrance from the street through the common hallway. This arrangement decreases troubles from mixing of classes during arriving and departing of pupils. Each classroom accommodates from 35 to 40 children. For every two rooms a toilet for boys and one for girls are provided.

The day- and playrooms have large windows on opposite sides giving adequate lighting and ventilation. Separation of these rooms by glass partitions allows the teacher free observation. The auditorium, with 250 to 300 seats, serves as a lecture and community hall, and for children's exercise in daytime.

The janitor's apartment is located over the main entrance and has no windows toward the noisy playground. It overlooks, however, the street entrances of the individual classrooms.

The structure is of reinforced concrete frame. Walls, floors and roofs are insulated with hollow tile. The walls and ceilings are plastered. Doors are of plywood with rubber-cushioned steel-jambs. The interiors are finished in washable paint.



Glass Partitions Separate Play and Dining Rooms

Hallway has Open Wardrobes and Separate Street Entrances

KINDERGARTEN IN ZURICH-WIEDIKON, SWITZERLAND
KELLERMULLER AND HOFMANN, ARCHITECTS

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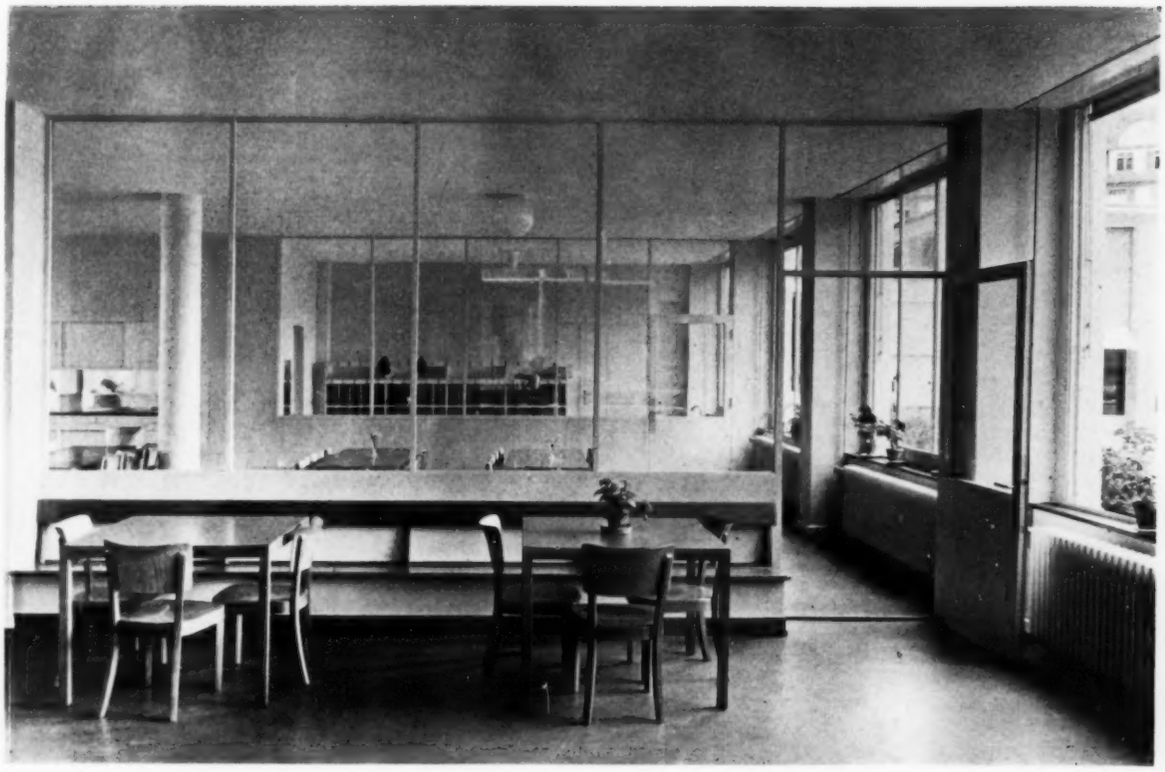

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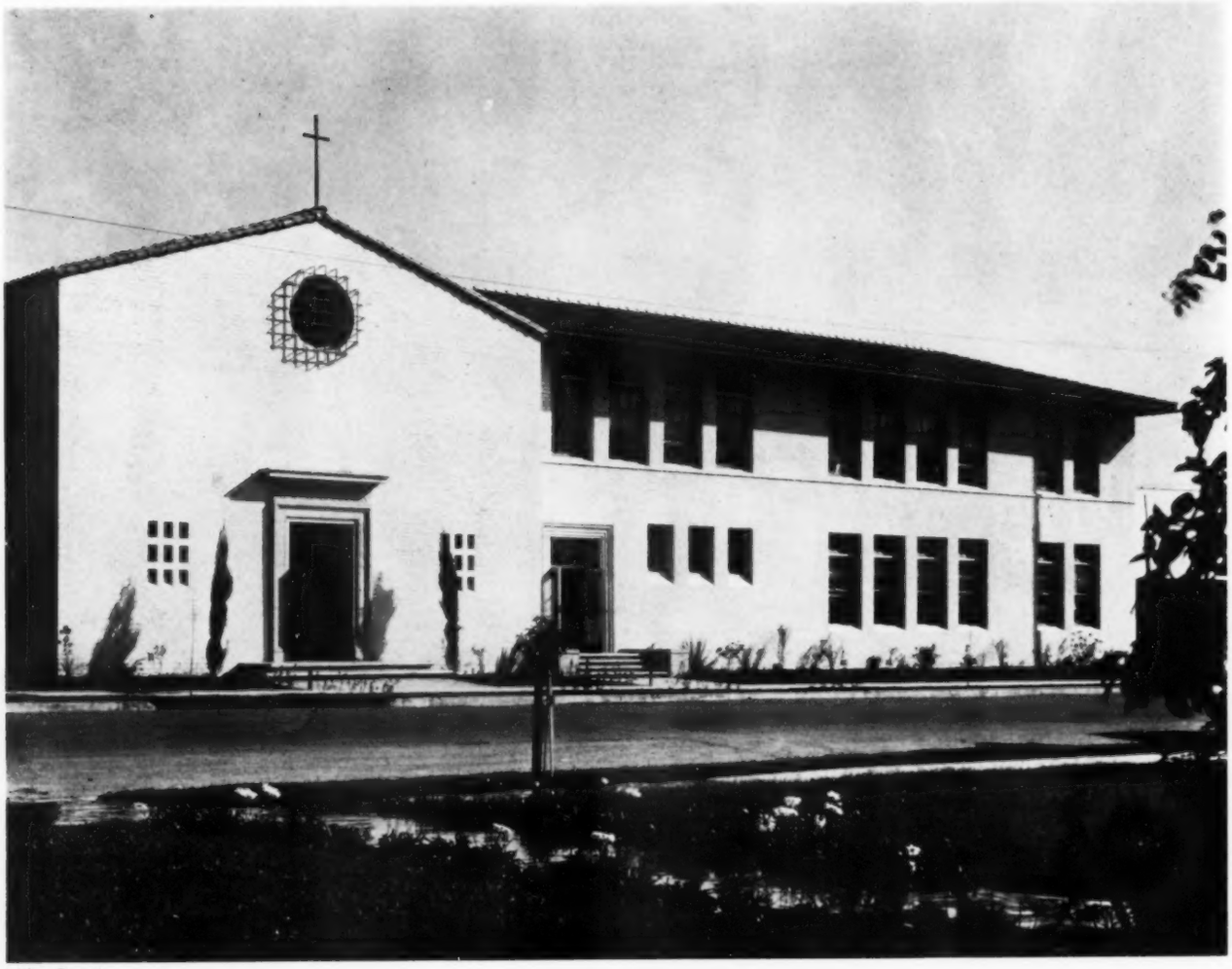
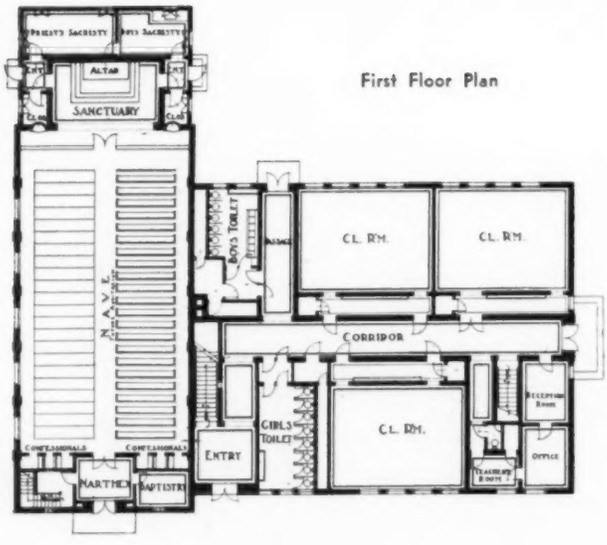
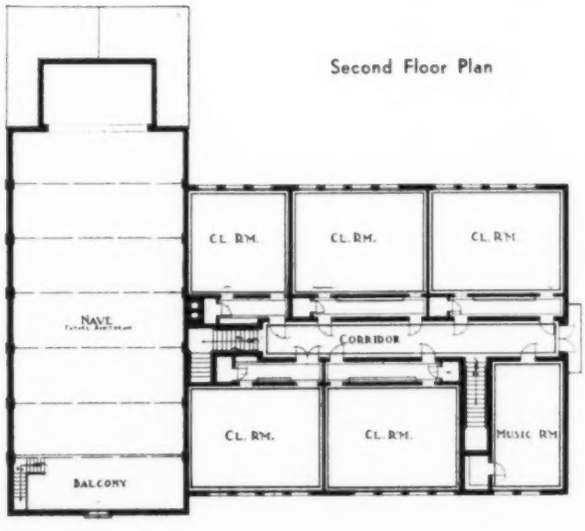
KINDERGARTEN IN ZURICH-WIEDIKON, SWITZERLAND
KELLERMULLER AND HOFMANN, ARCHITECTS



Miles Berné



First Floor Plan

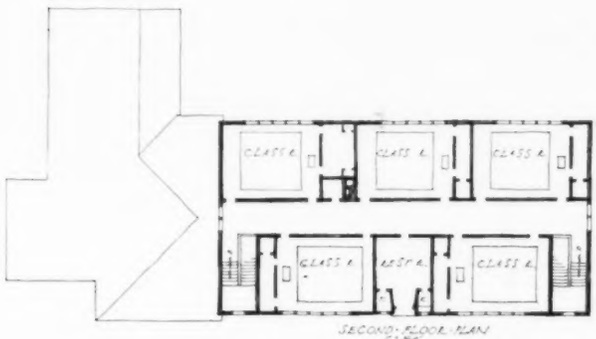


Second Floor Plan

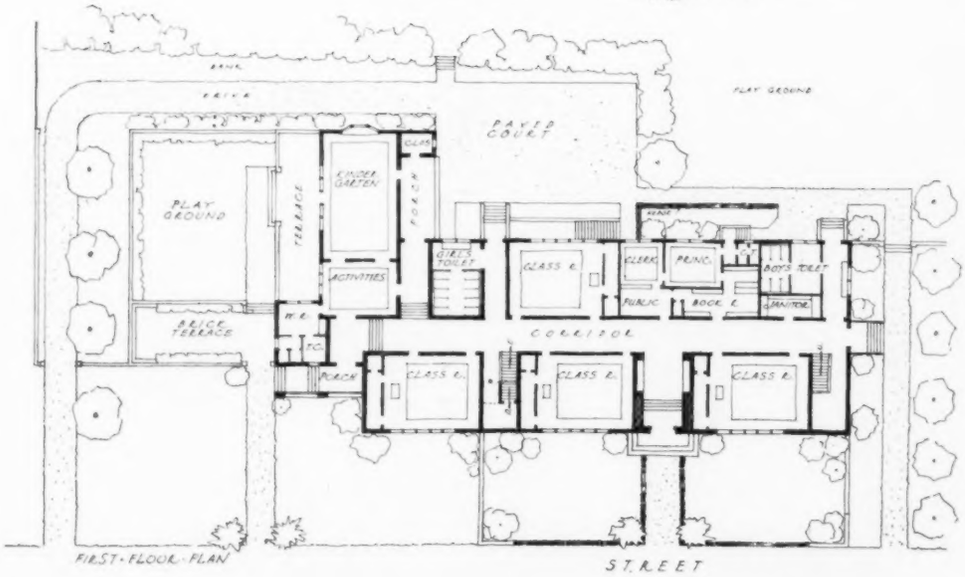
ST. JOHN'S SCHOOL IN INGLEWOOD, CALIFORNIA—NEWTON AND MURRAY, ARCHITECTS

DICKENS STREET SCHOOL
SHERMAN OAKS, CALIFORNIA

WINCHTON LEAMON RISLEY
ARCHITECT

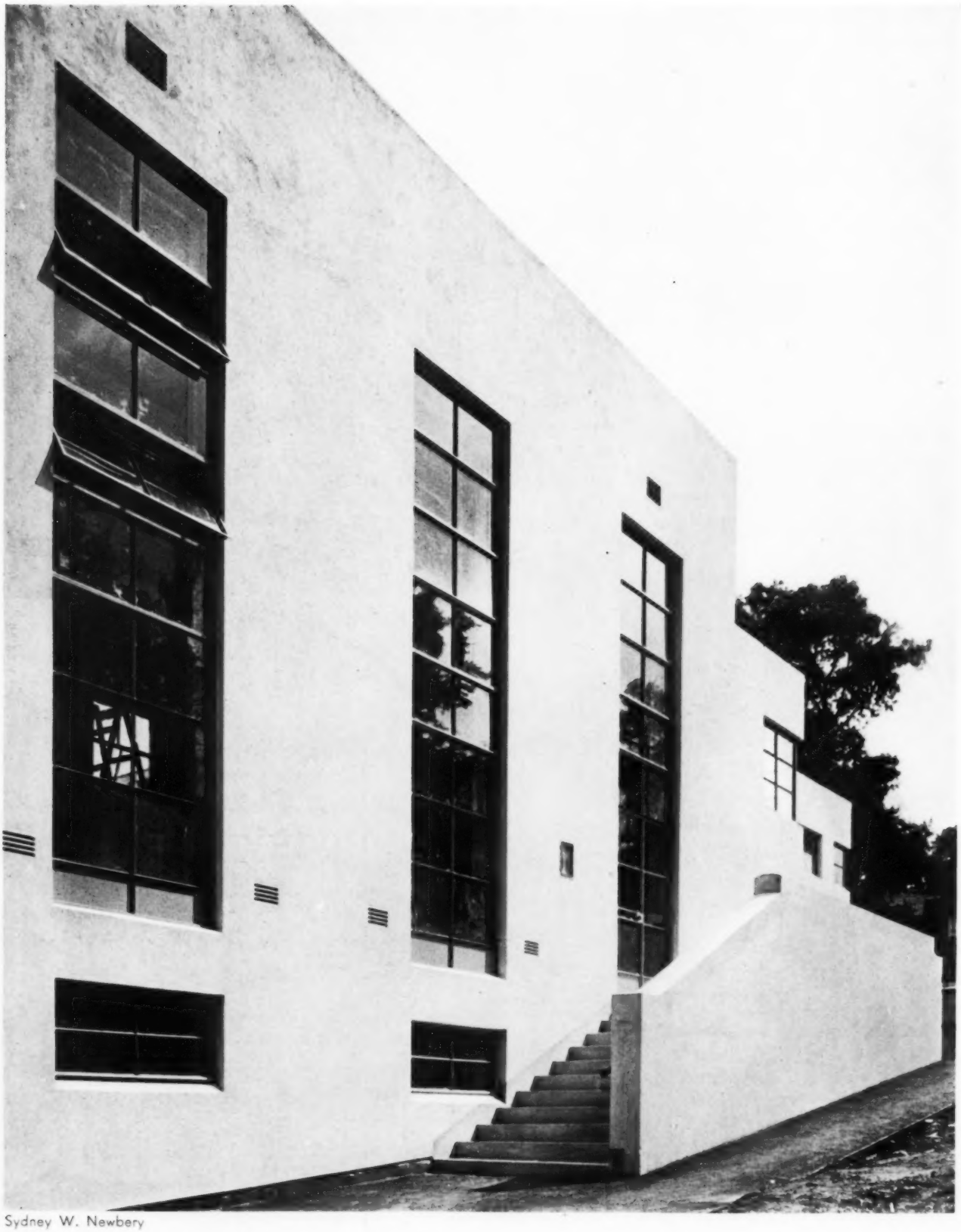


SECOND FLOOR PLAN



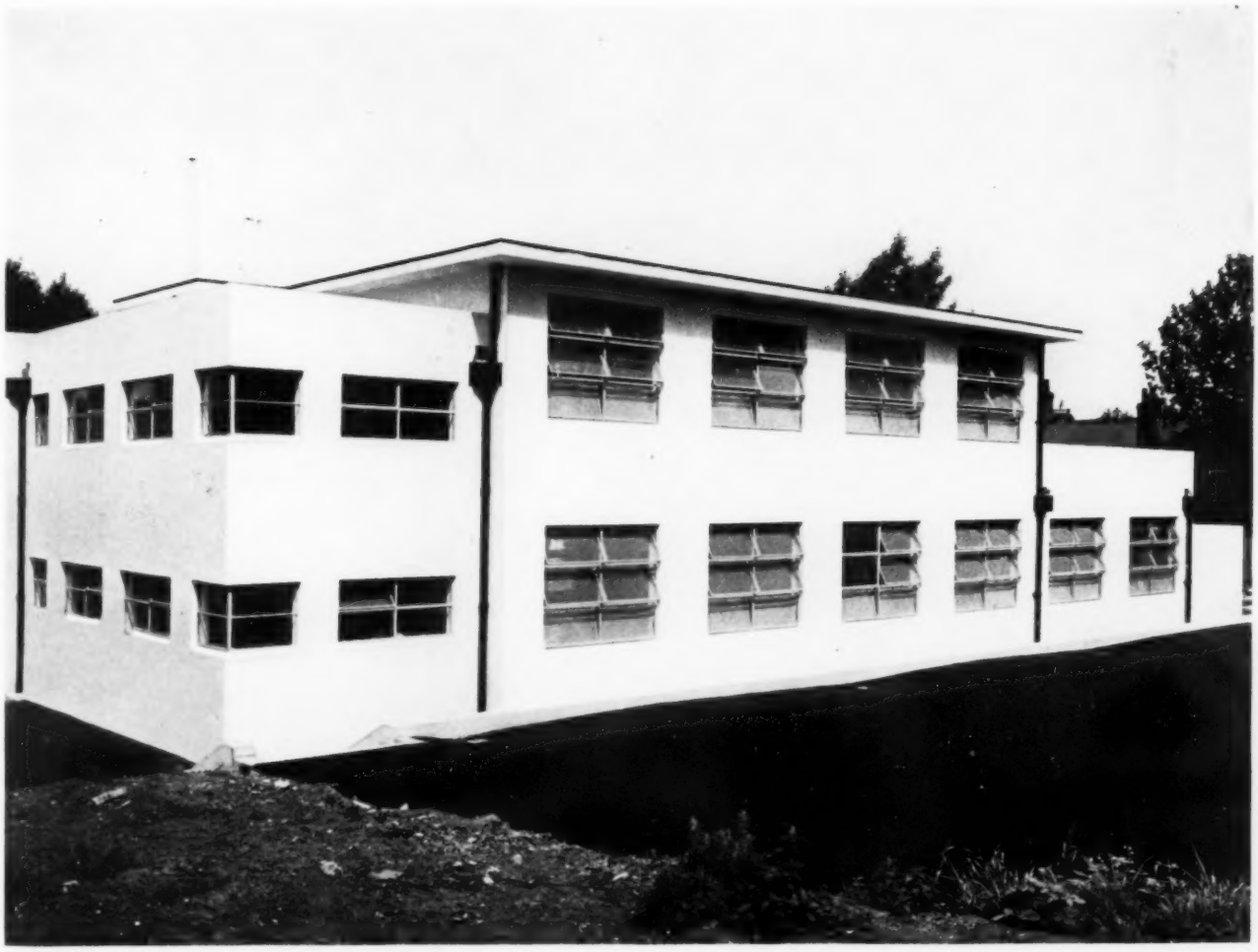
FIRST FLOOR PLAN

STREET



Sydney W. Newbery

ST. ANSELM'S SCHOOL AT HARROW, ENGLAND—ALLAN D. REID, ARCHITECT



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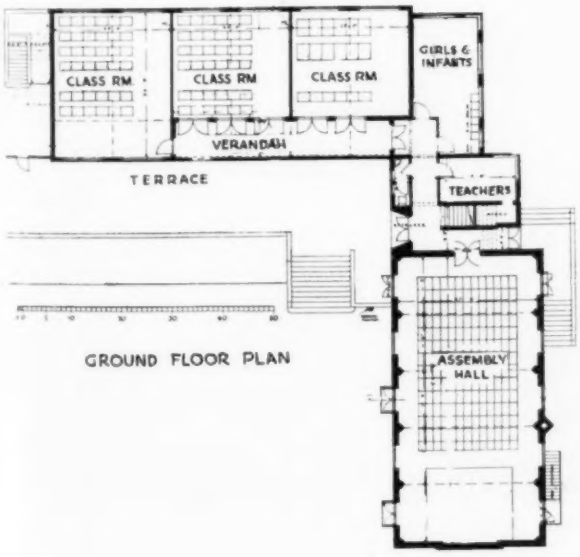
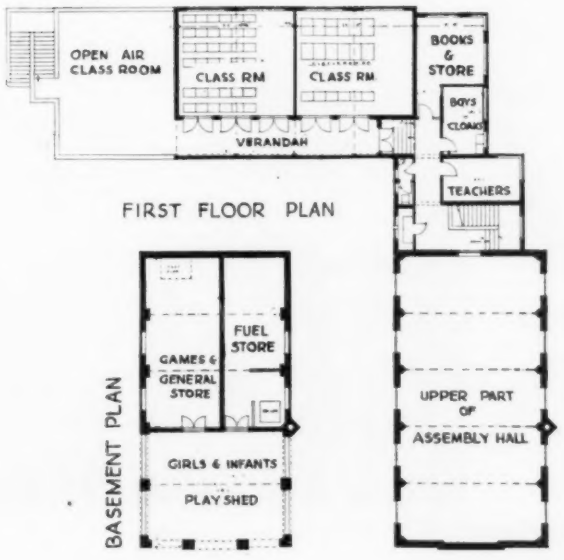


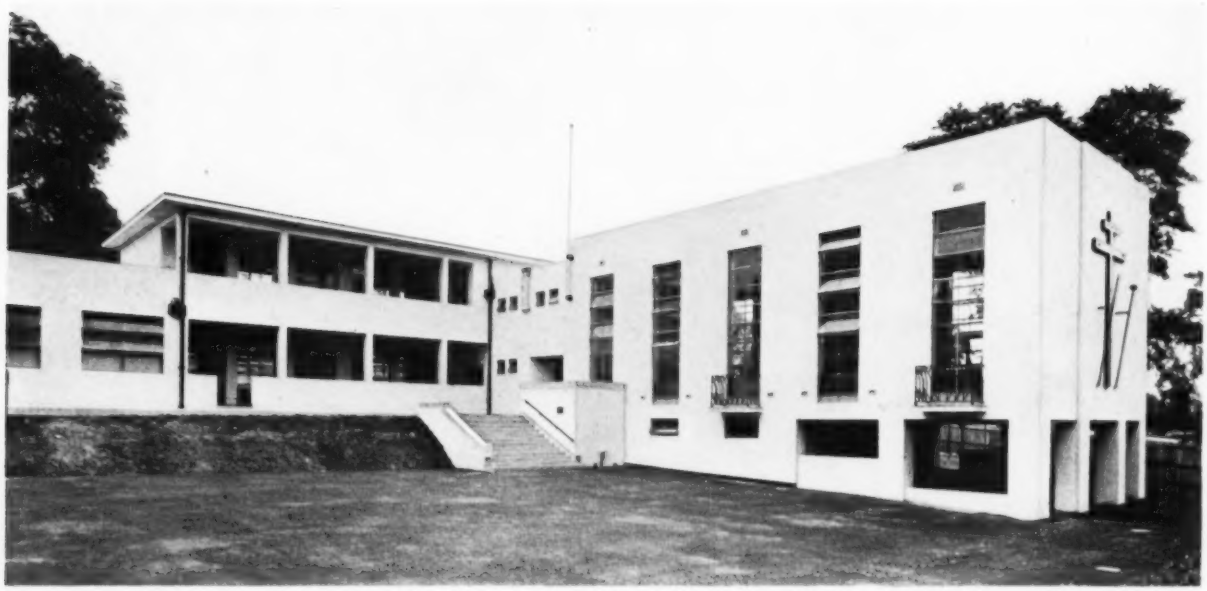
GROUND FLOOR PLAN



FIRST FLOOR PLAN

BASEMENT PLAN

ST. ANSELM'S SCHOOL AT HARROW, ENGLAND—ALLAN D. REID, ARCHITECT



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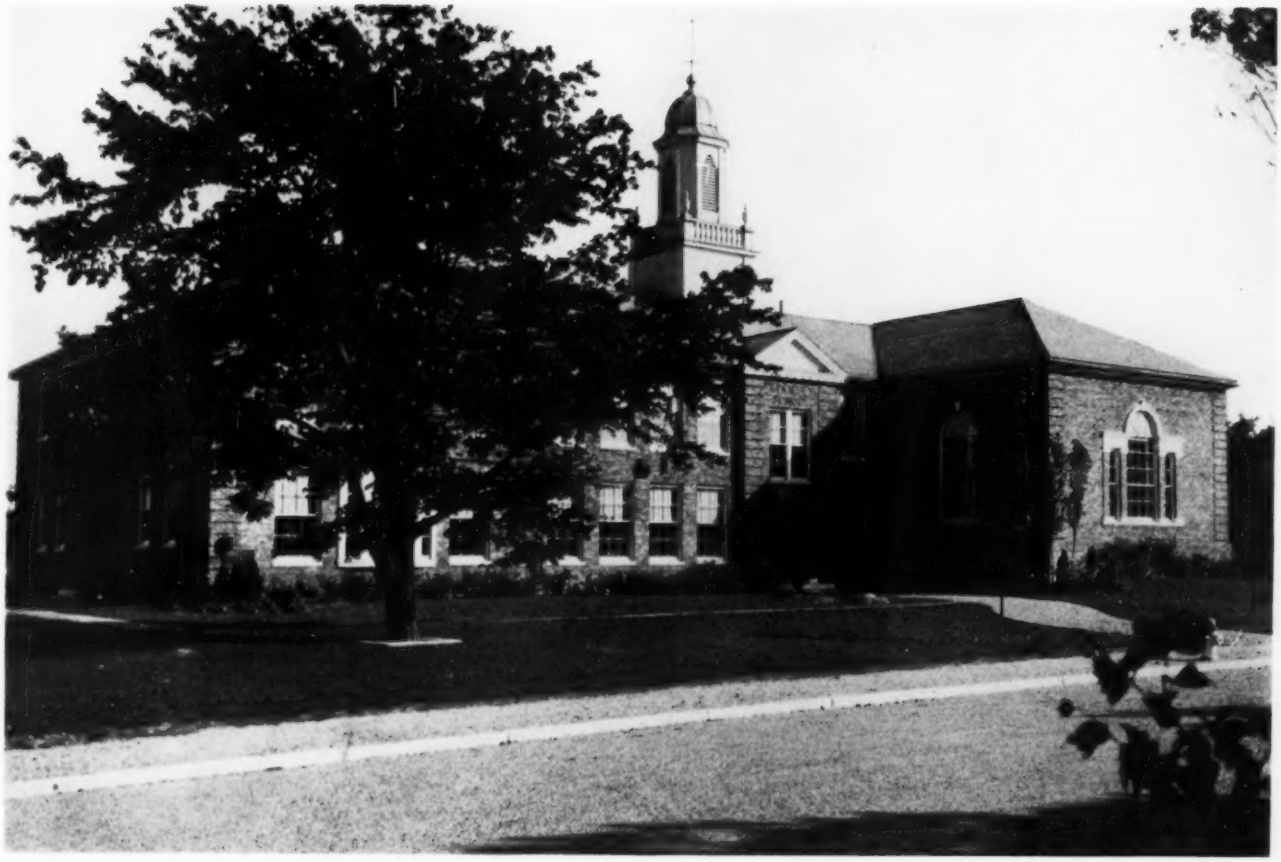
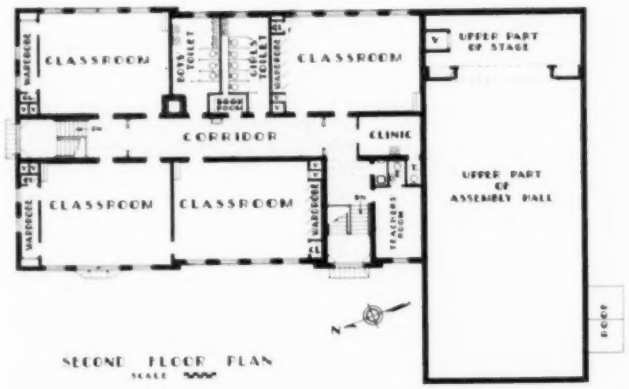
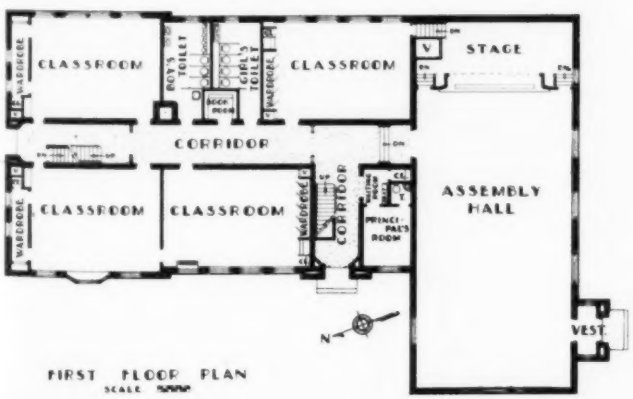




STANLEY SCHOOL
SWAMPSCOTT, MASSACHUSETTS

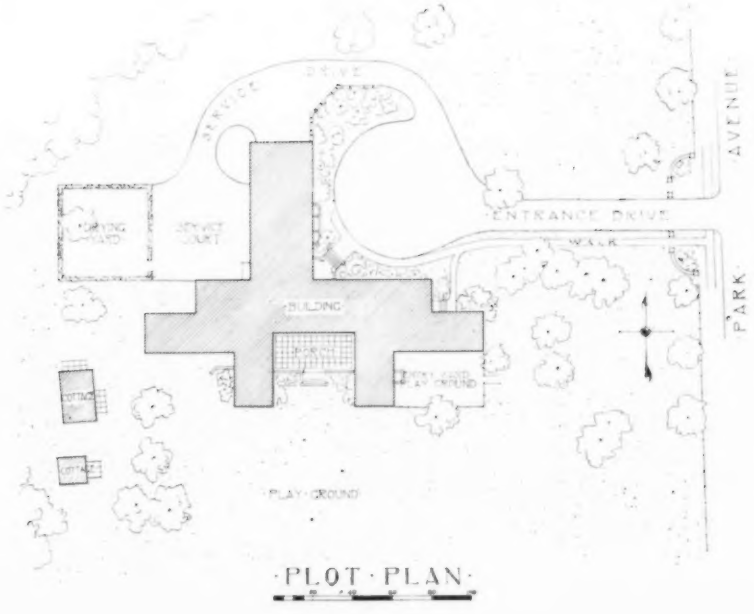
KILHAM, HOPKINS & GREELEY
ARCHITECTS



Samuel H. Gottscho

HOME FOR CONVALESCENT BABIES
SEA CLIFF, LONG ISLAND

PEABODY, WILSON AND BROWN
ARCHITECTS



PLOT PLAN

Samuel H. Gottscho

HOME FOR CONVALESCENT BABIES SEA CLIFF, LONG ISLAND

PEABODY, WILSON AND BROWN ARCHITECTS

Located in a high 12-acre grove, the Home is maintained for needy, delicate, ailing or convalescent babies and young children who have been confined to hospitals or similar institutions in the metropolis and adjacent cities. A total of 68 children can be comfortably housed, ranging in age from three months up to seven years. They stay for a period averaging a month, under constant supervision of the necessary staff of nurses, servants and an attending physician, for whom ample accommodations are provided.

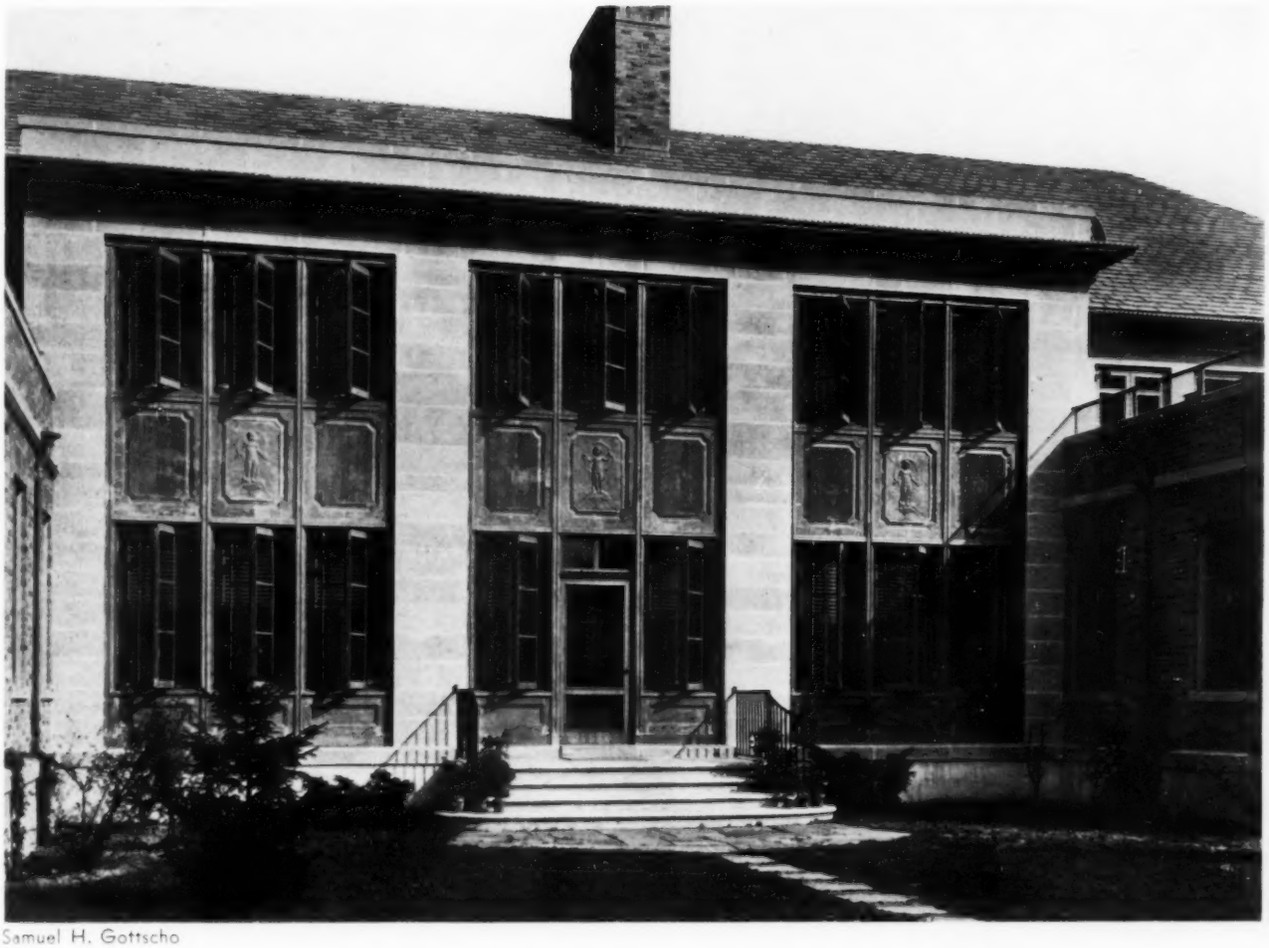
The building is of fireproof construction throughout. Exterior walls are faced with variegated buff brick, trimmed with artificial stone of limestone color; roof is of green slate, metalwork of lead-covered copper. Basement, corridors, store rooms, kitchen, laundry, stair halls throughout and dumbwaiter shafts are finished with enamel face terra cotta. All interior stairs are of iron with slate treads and landings.

In addition to administration department, the first floor contains an entry ward accommodating ten children, with its bath and playground where new arrivals are kept under observation for a short period. A contagious ward has accommodations for seven, with separate entry, playyard and necessary service rooms. Wards for girls and boys, each with capacity of fifteen children over two years of age, are provided with separate toilet and dining facilities. Rooms for male servants are located in a separate section of north wing, with private stairway to basement.

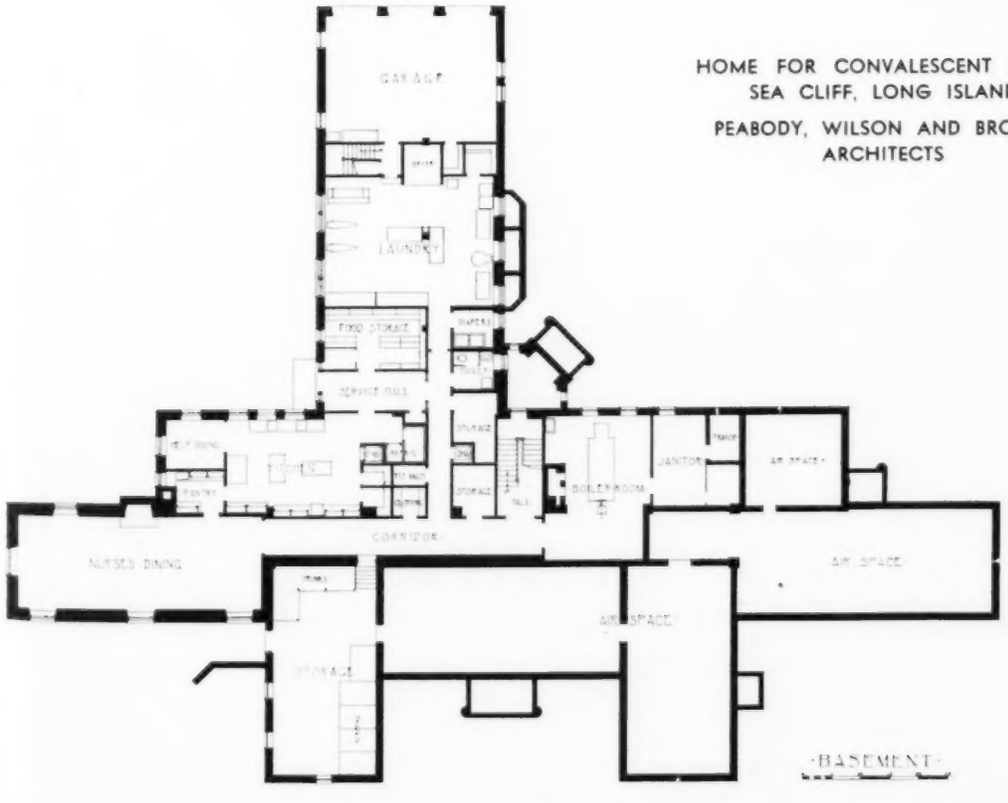
Second floor contains a toddlers' ward with capacity of ten children up to two years of age and infants' ward accommodating eleven. A separate quiet room is provided, also room for head nurse and twelve rooms in north wing for nurses. Female servants are housed in six rooms on third floor, north wing. Large sun parlors are provided on first and second floors.

COUNTRY HOME FOR CONVALESCENT BABIES AT SEA CLIFF, LONG ISLAND

PEABODY, WILSON AND BROWN
ARCHITECTS



Samuel H. Gottscho



HOME FOR CONVALESCENT BABIES
SEA CLIFF, LONG ISLAND

PEABODY, WILSON AND BROWN
ARCHITECTS

Playroom and Sun Porch

Samuel H. Gottscho

Reception Room

COUNTRY HOME FOR CONVALESCENT BABIES AT SEA CLIFF, LONG ISLAND

MODERNIZATION and ALTERATION

Smith, Lindsley & Arnold

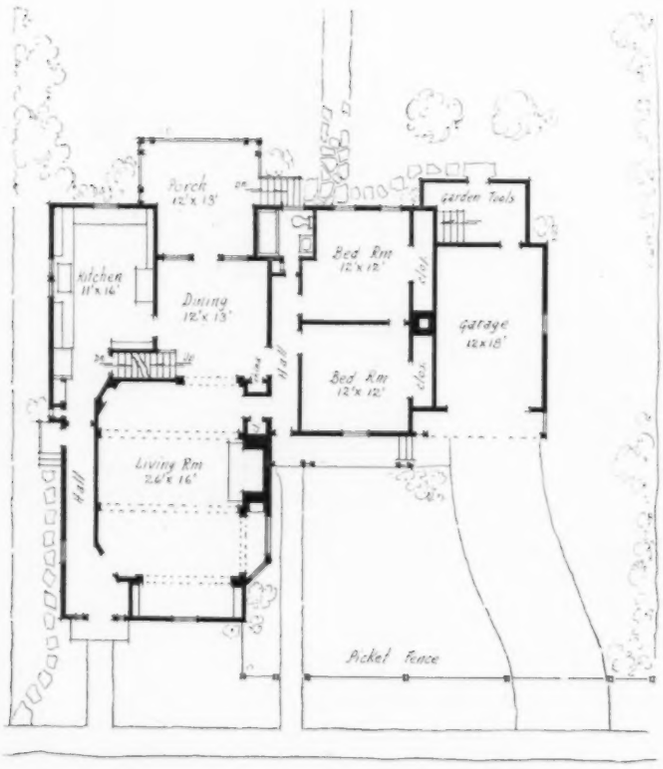
REMODELED HOUSE OF MISS ANNE L. MAC LEOD AND MISS EDITH NASON
FAYETTEVILLE, NEW YORK — CHARLES H. UMBRECHT, ARCHITECT

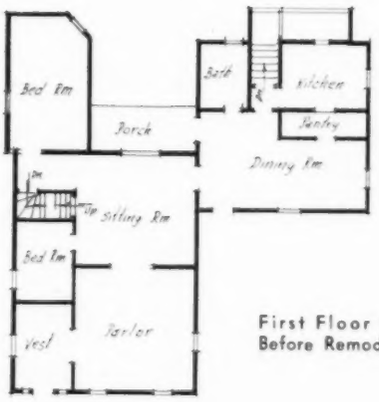
HOUSE BEFORE REMODELING

Smith, Lindsley & Arnold

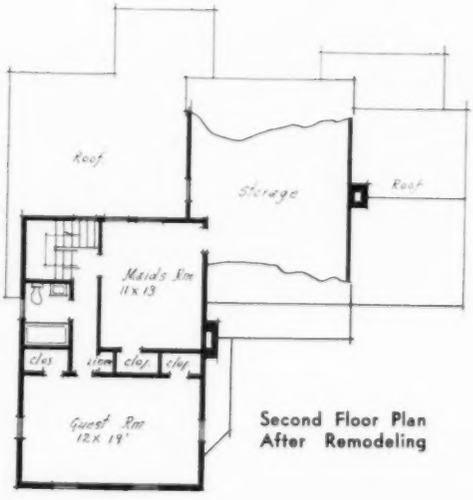
REMODELED HOUSE OF MISS ANNE L. MAC LEOD AND MISS EDITH NASON AT FAYETTEVILLE, N. Y.

CHARLES H. UMBRECHT, ARCHITECT





First Floor Plan Before Remodeling



Second Floor Plan After Remodeling

Smith, Lindsley & Arnold

REMODELED HOUSE OF MISS ANNE L. MAC LEOD
AND MISS EDITH NASON AT FAYETTEVILLE, N. Y.

CHARLES H. UMBRECHT, ARCHITECT

RENOVATING HOUSES FOR RESALE

By NORMAN N. RICE, Architect

In the competition of a diminished market, the renovated city house presents certain definite advantages: (1) it is usually in a neighborhood more convenient to stores, schools, the center of town and rapid transportation; (2) its selling price is low compared to new houses of the same size and of approximately the same standards. To many buyers, these advantages overbalance the newness and qualities of a house in an outlying district at a higher price.

The object in renovating for resale is to raise the quality and attractiveness of the older house towards the standards set by the new houses. Since buyers are usually familiar with these standards, the renovated plan, equipment and finish should approach, as closely as possible, those of the new houses. The buyer expects such things as hot-water heating, a tiled bathroom with modern fixtures, a well-equipped kitchen, hardwood floors, and a garage. However, many renovated houses which lack such features are sold; they have been improved only by painting, wall-papering, general repairs and minor alterations. A comparatively low price is the important factor in selling.

The difference between this selling price and the original buying price, the original condition of the house, and the character of the neighborhood are the factors which determine the extent and cost of the alterations and control the limit of improvements to be made. Some houses require "retouching" only. Others are in such poor condition that the cost of reclamation would raise the selling price above the competitive level. There have been cases of houses reduced to mere shells by deterioration and vandals and then reclaimed and sold at a profit to the operator. Some neighborhoods do not warrant the installation of first-class equipment and finish; others call for the best of improvements.

CHECKLIST OF SUGGESTED ALTERATIONS

ROOM REQUIREMENTS (asterisks mark optional items)

First Floor
Living room
Dining room
Kitchen
Coat closet
*Breakfast room or alcove
*Entrance vestibule
*Sun room or porch
*Utility closets

Second Floor
Bedroom (3 preferred)
Bath
Clothes closets
*Linen closet
*Cedar closet

Basement
Fuel storage
Laundry facilities
*Toilet
*Recreation room

Garage
Built-in basement
Detached

FOUNDATION WALLS

Damp-proofing
Waterproofing

EXTERIOR WALLS

Repointing
Resurfacing (paint, stucco)
Block up unused openings
Waterproofing
Cut and patch for new openings
Alter obsolete façades and ornaments

ROOF

Repair leaks
Replace defective gutters and downspouts
Repair or replace defective flashing
New roofing over old roof

WINDOWS AND EXTERIOR DOORS

Caulking
Replace defective pulleys, cords, hardware
Replace defective frames, sash, doors, trim
Glazing
Weather-stripping
Screens
New doors and windows
Painting

BASEMENT

Repointing walls
Plaster walls
Painting
Concrete floor (hardened, untreated)
Rough-casting on walls
Whitewashing
Finish ceiling (plaster, wallboard)

GENERAL INTERIOR

Scrape and refinish floors
Level sagging or settled floors
Remove obsolete ornaments and trim
Remove walls to make open stairway
Enlarge rooms
Painting
Special wall finishes
Replace defective hardware
New flooring over the old floor
Replace defective trim and millwork
Replace stair treads
New openings between rooms
New rooms and closets
Wall-papering
Repair plaster cracks

KITCHEN

Linoleum, rubber tile, etc., on floor
Additional or new cupboards
Replace obsolete sink and fittings
Wall tile (ceramic, composition)
Gas range
Built-in ironing board

BATHROOM

Replace obsolete fixtures
Install shower, medicine cabinet, towel bars, etc.
Linoleum, rubber tile, etc., on floor
Wall and floor tile
New bathroom and fixtures

PLUMBING

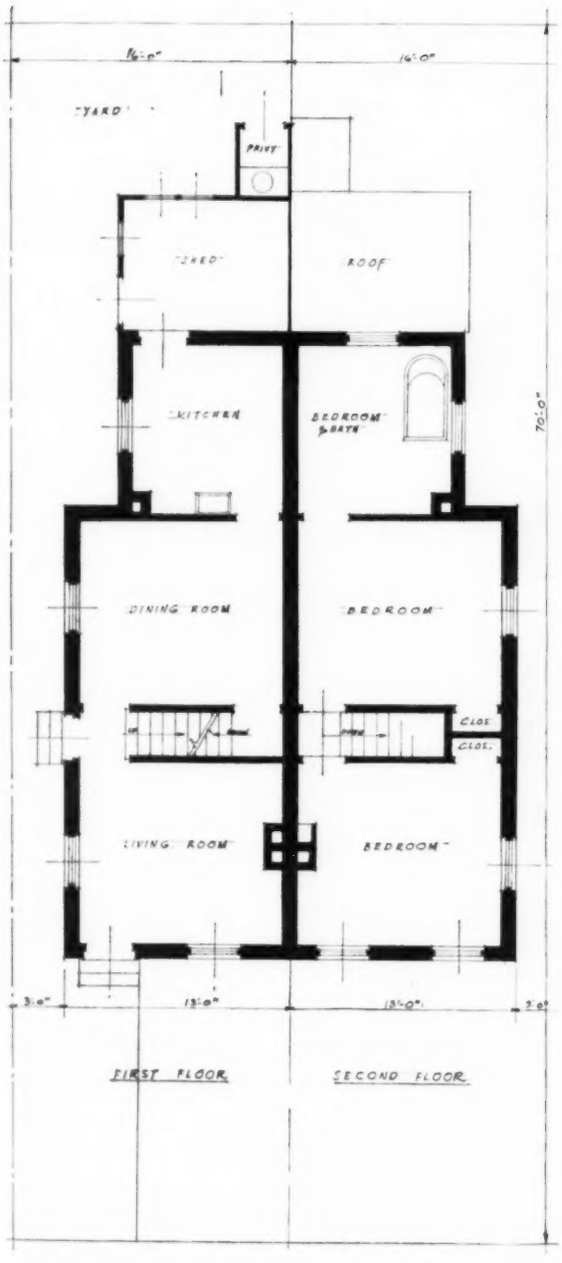
Replace defective or obsolete piping, fittings, fixtures
New supply and drainage systems
New gas lines (range, hot-water heater)
Cut and cap unused water and gas lines
Additional fixtures; hot-water heater (gas or coal fired) and storage tank, laundry trays, garage water supply, wash paves, basement, toilet, etc.

HEATING

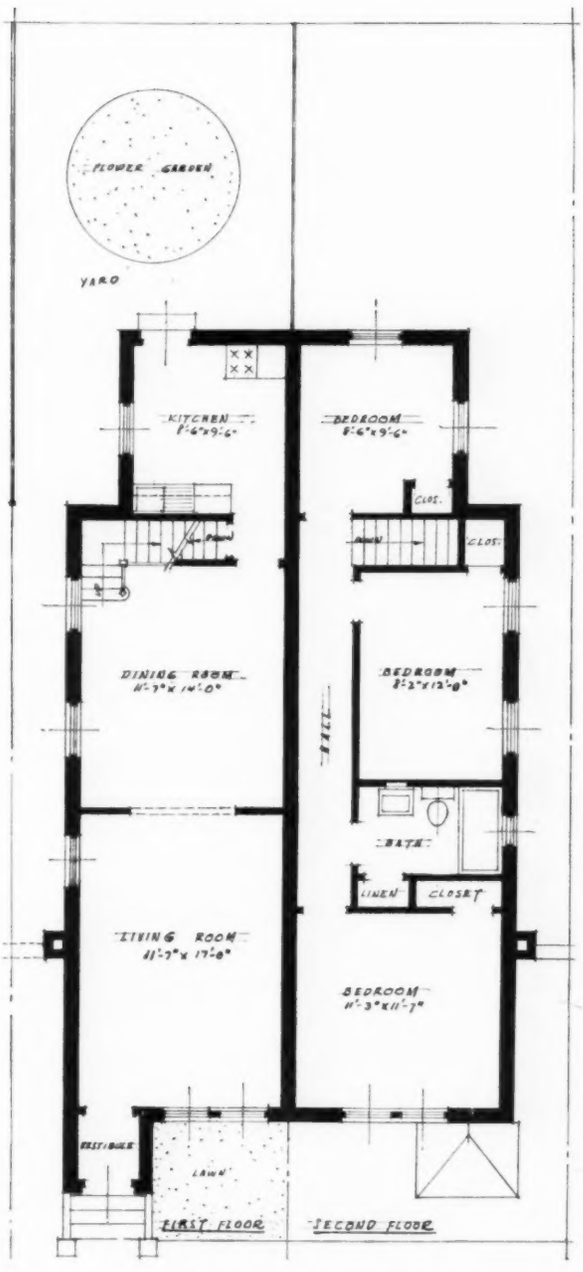
Replace defective or obsolete parts
Radiator covers
New heating system
Increase radiation
Paint radiators, fittings, piping, furnace

ELECTRICAL WORK

Additional ceiling, wall and base outlets
Replace lighting fixtures, switches, base receptacles, cover plates
New wiring system, outlets, fixtures
Replace defective or obsolete wiring
Radio aerial and wiring (exposed, built-in)



Plan Before Alterations



Plan After Alterations

TWO-FAMILY HOUSES IN PHILADELPHIA REMODELED BY NORMAN N. RICE, ARCHITECT

The original seven houses illustrated in the accompanying plans were not of the usual Philadelphia type. Although they were over thirty years old, in poor condition, extremely small and narrow, and contained the most primitive plumbing, heating and electrical equipment, their original cost and the character of the neighborhood warranted extensive alterations and improvements.

In order to obtain three bedrooms and a bath on the second floor and large living rooms on the first, the old front walls were ripped out and 9′ 6″ extensions built. (The old houses were set back 16 feet from the building line.) This operation also provided new fronts. The rear sheds and privies were removed, and the now open yards concreted, separated by low hairpin fences, and circular flower beds planted. The steep and dark stairways were replaced by new open stairways set at the rear of the dining rooms. This change opened up the front rooms to a maximum and permitted the virtual merging of the living and dining rooms, thus masking the narrowness of the houses. The cross stairs also minimized the second-floor halls and placed all available space in the rooms. Although garages were desirable, the basements were too far below grade for built-in garages, and the lots too shallow for detached garages except at the corner.

Figure 1 - EXISTING PLAN

Figure 2 - REVISED PLAN

Old tenements such as these, which are typical of many existing in New York City, can be remodeled into attractive apartment suites and at the same time be made remunerative investments, Mr. Lench has found from experience. In this article he analyzes three different projects which have come to his office.

NEW APARTMENTS FOR OLD

By CHARLES H. LENCH, Architect

Present conditions in the building industry indicate that architects who are qualified, by training and experience, to assist in solving the problems of refinancing involved in modernizing obsolete income-producing buildings, will be kept busy for several years to come. As an example of the wide variety of work to be expected, there are illustrated herewith three different types of modernization that recently have come to my office.

Fig. 1 shows the floor plan of two adjoining apartment houses, and Fig. 2 the plan for the alteration. The buildings are classified in the Multiple Dwelling Law as old-law, nonfireproof tenement houses. They are five stories in height and have no elevators. Inasmuch as all tenants had vacated, it was essential that the buildings be rehabilitated or torn down. Demolition was not a practical solution. To demolish is to destroy capital already invested; provided the buildings could be rehabilitated economically by the addition of new capital, it seemed unreasonable not to invest it. The financial set-up will tell the story.

There is a demand in the neighborhood for modern suites, if they can be produced to rent for approximately $14 per room per month. The problem, therefore, was to develop a plan that would produce enough annual income to enable the owner to take care of operating costs, municipal taxes, depreciation and interest on the first mortgage; after which there should be a surplus for interest and amortization of his cash investment.

At least ten different floor plans were developed before it was decided that the layout illustrated in Fig. 2 probably was the best. The plan has obvious disadvantages which, however, were given due consideration in comparing it with other

studies. For example, access to the bathroom, in the front apartment, is obtained only by passing through the bedroom. It was found to be practically impossible, inasmuch as the bathroom to be legal must have natural light, to reach it without passing either through the bedroom or through the living room. It was deemed preferable in this case to reach it through the bedroom. Access to the bathroom from the chambers in the rear apartment is obtained only by passing through the living room. In this case the bathroom could have been located adjoining the rear bedroom by sacrificing the secondary bedroom. This room, however, existed in the original building and, although small, legally could be retained. It was thought that the advantage to a family of being able to use this room as a child's room would more than offset the disadvantage of having to go through the living room to reach the bathroom. Furthermore, the building is in a neighborhood where families frequently take in boarders. The room adjoining the kitchen can be rented to a boarder, who can reach the bath without passing through the living room. In case this room is not rented, it can be used as a dinette. The rear of the buildings has southern exposure and although the courts are narrow, there is excellent light, even on a dull day, in the living rooms of the rear apartments and in the chambers of the front apartments.

Figs. 3 and 4 show "before" and "after" layouts for a group of three adjoining buildings classified in the Multiple Dwelling Law as "dwellings heretofore converted." They are five stories in height and had been converted into nonhousekeeping apartments during the housing shortage after the War. These buildings, also vacant, presented an extremely difficult problem for modernization and refinancing, due to the fact that only the exterior walls at front and rear had the window light essential to rentable living units. The dwellings have a rear annex which can be utilized as the bedroom for the rear apartment. The rear wall of the building from the lot line to this annex is long enough to contain windows to light both a living room and a kitchen and dining alcove combination. The solution for the rear, therefore, is a three-room apartment. The width of the buildings is hardly sufficient to place two full rooms at the front, say a living room and a bedroom. One practical solution is a kitchen and dining alcove combination; another, a kitchen lighted by a window in the front wall and an alcove off the living

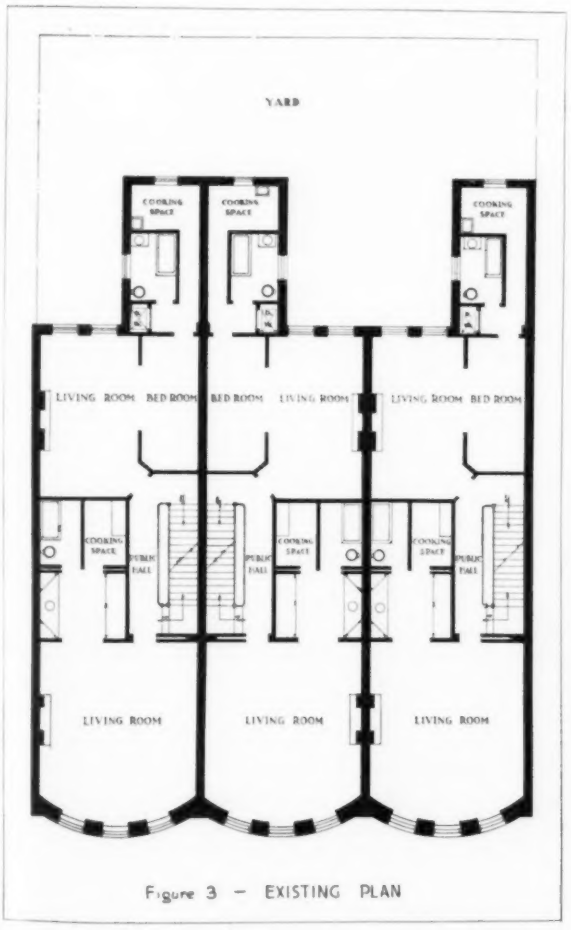


Figure 3 – EXISTING PLAN

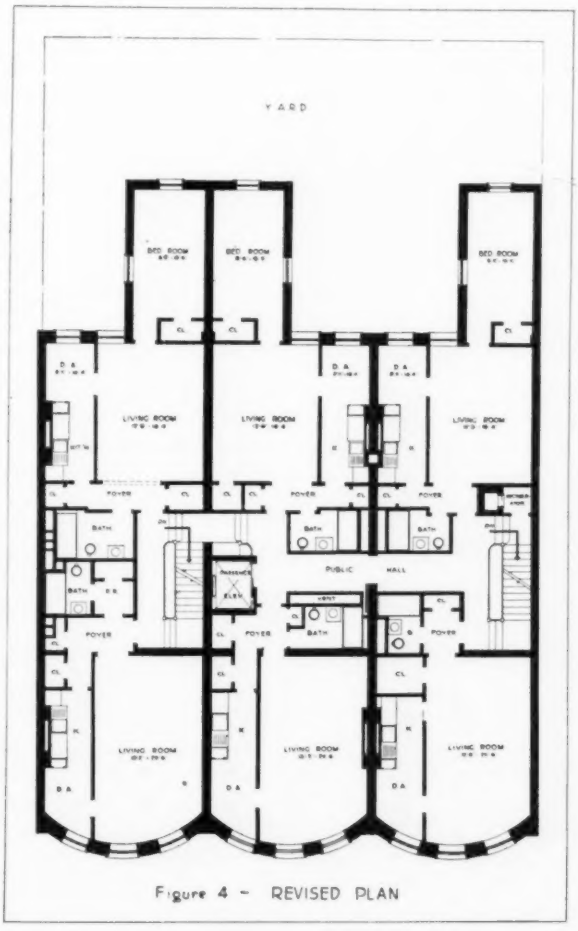


Figure 4 – REVISED PLAN

REMODELED APARTMENT PLANS BY CHARLES H. LENCH, ARCHITECT

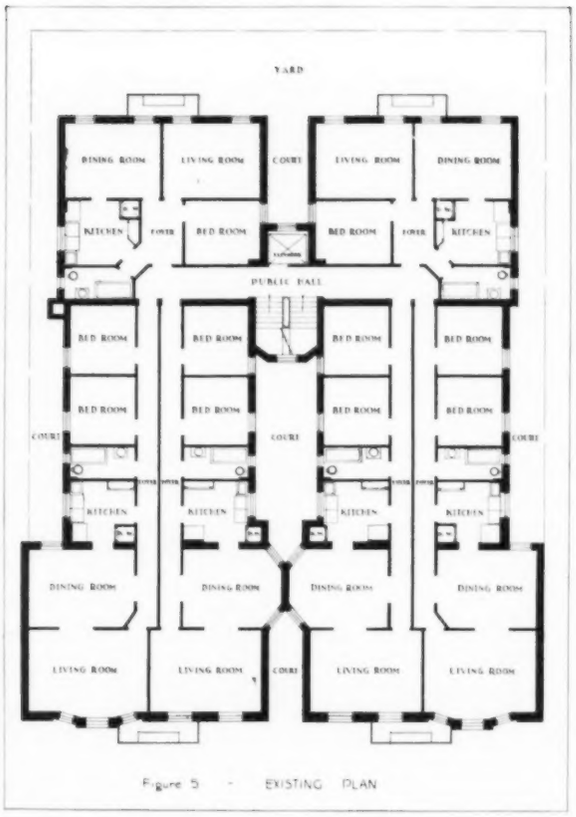


Figure 5 - EXISTING PLAN

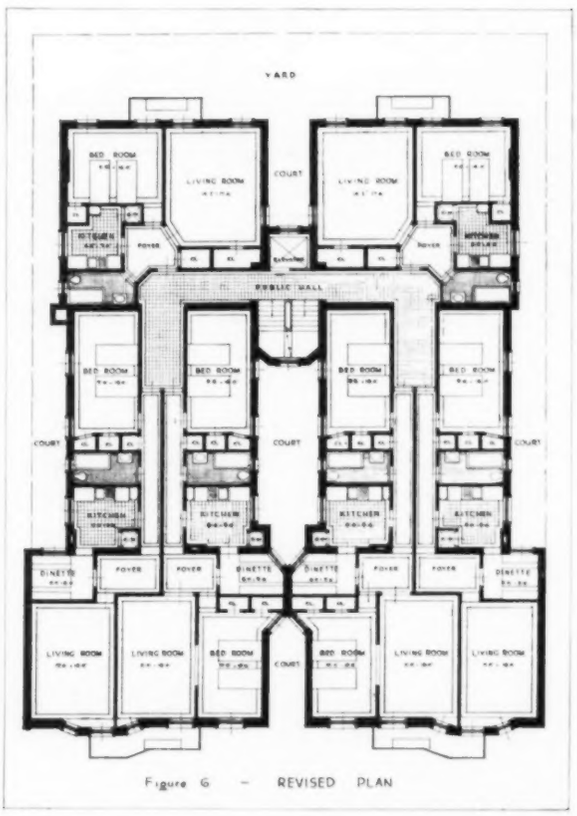


Figure 6 - REVISED PLAN

REMODELED APARTMENT PLANS BY CHARLES H. LENCH, ARCHITECT

room, the same depth as the kitchen, which can be used as a bed alcove.

Fig. 5 is the plan of a six-story elevator semi-fireproof apartment house, and Fig. 6 the plan for the alteration. Apartments in buildings of this kind contain long halls, ironically termed "bowling alleys." Rooms generally are small with layouts not suited to the demands of present-day tenants. Furthermore, in most cases, the apartments have too many rooms for all except large families. Such buildings, it should be recalled, were erected thirty to thirty-five years ago and the mechanical equipment is obsolete. It is believed that the long halls within the front apartments have been reduced to a minimum by extending the public halls to the limit allowed by law and by locating foyers adjoining the brick bearing wall which runs transversely in the building and parallel with the front wall.

New apartments for old! If the architectural profession will sense the unusual possibilities in this important field, it will not be long before the entire business of the country will be stimulated appreciably.

BUILDING MODERNIZATION PAMPHLET PREPARED BY PENNSYLVANIA ARCHITECTS

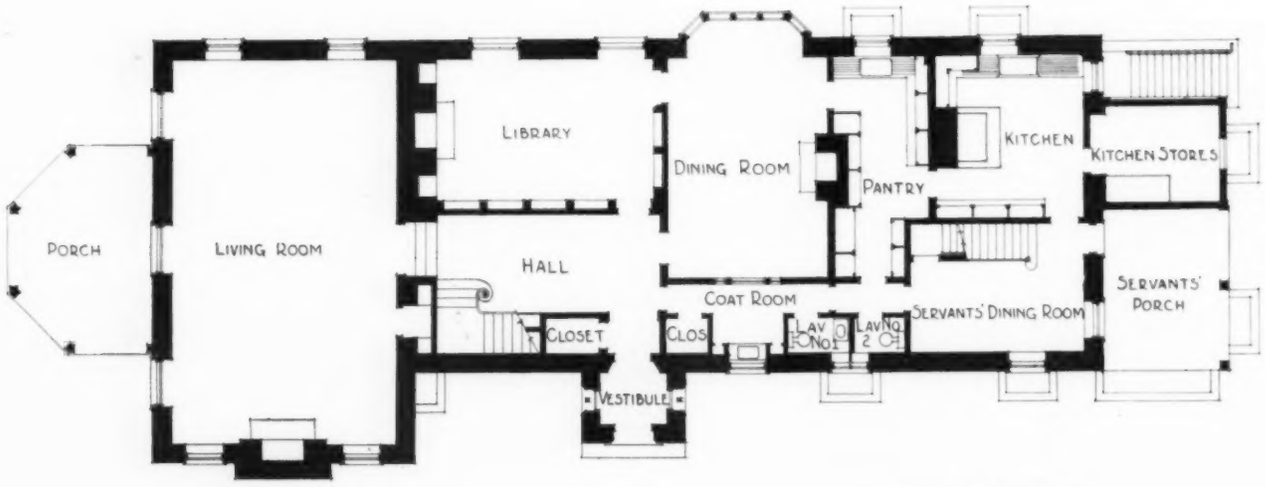
As part of a campaign for remodeling and modernizing buildings, the Northwestern Pennsylvania Chapter of the American Institute of Architects has prepared a pamphlet entitled "How Can My Property Be Improved?" and containing fifty suggestions in answer to this question. These suggestions were compiled by a Chapter committee in collaboration with manufacturers and dealers in Erie, Pennsylvania. Four thousand folders were printed; of these fifteen hundred were mailed with a multigraphed letter to a selected list of property owners, and the rest then divided among the architects, manufacturers and dealers for individual distribution. The cost of the survey and folders divided among all concerned amounted to $2.50 each.

PORTFOLIO OF COUNTRY HOUSES

Miles Berné

HOUSE OF WALTER ARMACOST IN LOS ANGELES—JOHN BYERS, ARCHITECT

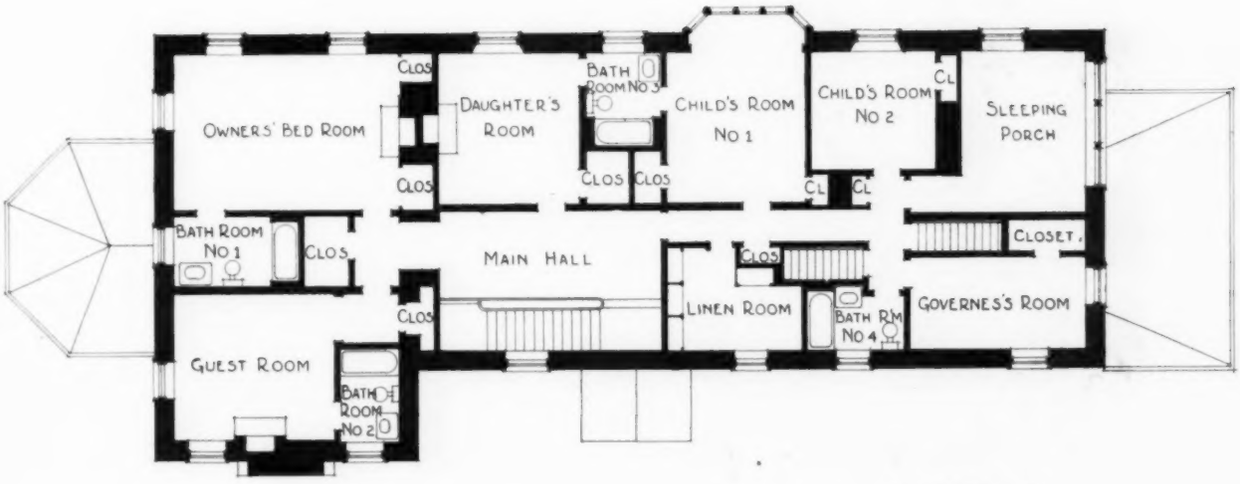
Richard Averill Smith



Ground Floor Plan

HOUSE OF WILLIAM H. FAIN AT GREENWICH, CONNECTICUT
DELANO AND ALDRICH, ARCHITECTS — ROBERT L. FOWLER, LANDSCAPE ARCHITECT

Richard Averill Smith



Second Floor Plan

HOUSE OF WILLIAM H. FAIN AT GREENWICH, CONNECTICUT

DELANO AND ALDRICH, ARCHITECTS — ROBERT L. FOWLER, LANDSCAPE ARCHITECTS

Façade Facing the Lake

Jessie Tarbox Beals

Terrace

HOUSE OF EARL H. McCARTY AT LAKE GENEVA, WISCONSIN — FITZHUGH SCOTT, ARCHITECT

Jessie Tarbox Beals

Detail of Entrance

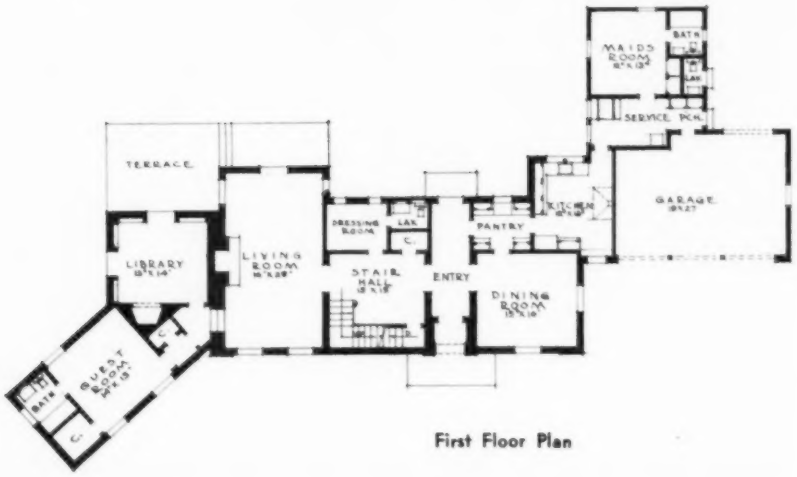
HOUSE OF EARL H. McCARTY AT LAKE GENEVA, WIS.—FITZHUGH SCOTT, ARCHITECT

Hiller

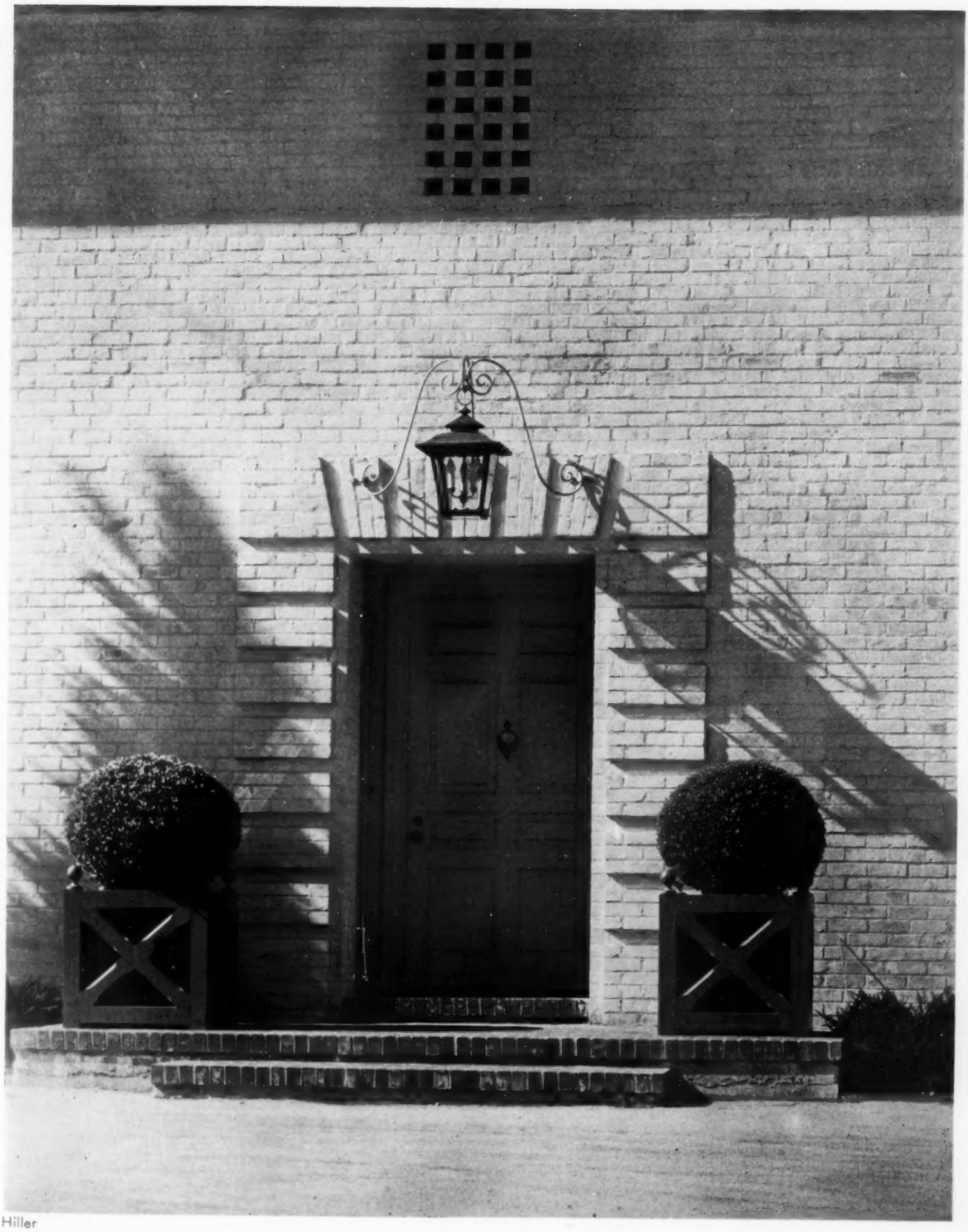
HOUSE OF CHARLES PADDOCK
PASADENA, CALIFORNIA

MARSTON AND MAYBURY
ARCHITECTS

Second Floor Plan



First Floor Plan



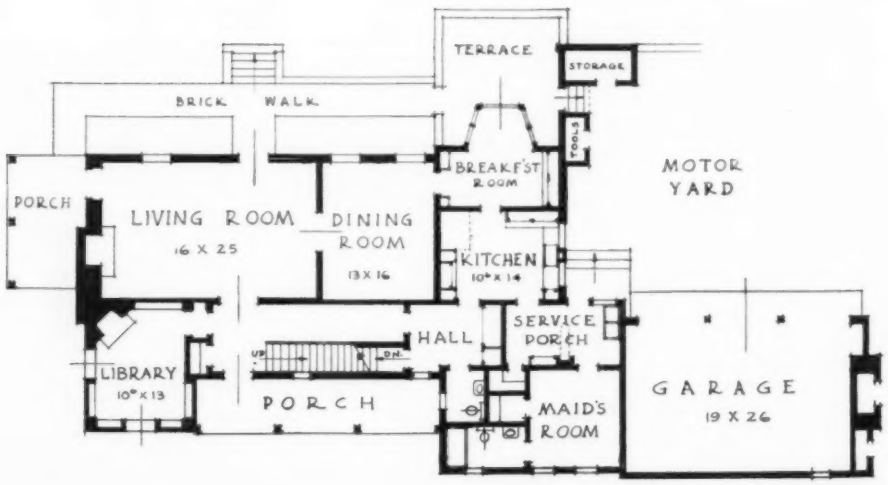
Hiller

HOUSE OF CHARLES PADDOCK AT PASADENA, CALIFORNIA — MARSTON AND MAYBURY, ARCHITECTS

Hiller

HOUSE OF JAMES L. BEEBE
SAN MARINO, CALIFORNIA

MARSTON AND MAYBURY
ARCHITECTS



THE NEW CINCINNATI UNION TERMINAL

N. A. Berthol

FELLHEIMER AND WAGNER, ARCHITECTS

ALUMINUM DETAILS

By DOUGLAS B. HOBBS
Aluminum Company of America

Two separate stations, located in different sections of the city and built when Cincinnati had only a fraction of its present population, had been used for more than 50 years and were totally inadequate for the present-day transportation requirements of the seven steam railroads entering the Queen City. A new terminal was a necessity and, after more than a decade of agitation, the Cincinnati Union Terminal Company was organized in 1927 and empowered to select a suitable site for the terminal and to execute all details of construction.

The Cincinnati Union Terminal Company is owned by the seven railroads which serve Cincinnati: the Baltimore and Ohio, the Chesapeake and Ohio, the New York Central, the Pennsylvania, the Norfolk and Western, the Southern, and the Louisville and Nashville.

Work was begun on the terminal project in 1929, and by the end of this year, the terminal and terminal facilities, which cover 287 acres, will have been completed at a total cost of $41,000,000. The station itself naturally stands as the central figure in this massive development, although sight must not be lost of the re-allocation of some 94 miles of track, the building of freight yards and adequate mail and express handling facilities, an engine terminal and a 3,500-foot viaduct, 2,500 feet of which are double decked.

Before any of the buildings could be erected or permanent tracks laid, a considerable portion of the land which had been acquired for the terminal project had to be filled in, as parts of it were completely inundated whenever the Ohio River rose to the 50-foot stage. The fill necessary to raise the general level one foot above the 71-foot flood level required the distribution of 5,600,000 cubic yards of material; at its deepest point, the fill had a depth of 58 feet. The foundations for the buildings in the terminal group, therefore, had to be sunk to ground that would provide sufficient support for the various structures and this was accomplished by driving piles to support 30 to 35 tons, approximately 712,000 lineal feet of piling being required for the several buildings.

The station, designed by Fellheimer and Wagner, architects, and erected by James Stewart and Company, Inc., contractors, is a semi-dome shaped structure with symmetrical wings on each of the two sides and a third wing at the rear which extends over the track platforms. The dome has an internal span of 180 feet: its crown is 120 feet above the main entrance level: and it is undoubtedly the largest permanent structure of this type ever built. The semi-circular façade, which forms the principal elevation, together with the two side wings, gives the station a total frontage of 550

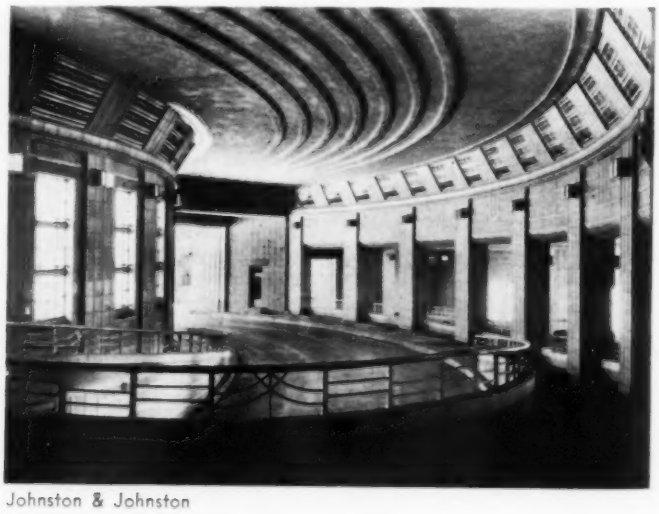
feet; while a landscaped parkway, 500 feet wide and 1,400 feet long, forms an impressive approach to make the station a true focal point in the community.

The interior of the station is designed with the comfort and convenience of the traveler as its underlying motif. The two side wings are in reality covered ramps. One wing is used for incoming taxi cabs and motor coaches, with space provided for street cars, and the other wing, for the outgoing vehicles, thus permitting a circular movement of traffic under the rotunda of the station. A garage is located beneath the plaza for the benefit of the traveler and for storage of taxi cabs and motor coaches. Ramps lead up to the rotunda of the station from the vehicular entrances and access may also be gained to the rotunda from the main entrance at the front.

In the rotunda, the paths naturally taken are suggested in the color scheme of the terrazzo. With the information booth as the central figure, the pathways in vari-colored terrazzo, which completely encircle it, are easily picked up by the traveler. The ticket offices are on one side of the rotunda, and the concessions on the opposite side and also on each side of the main entrance. The concessions are indeed complete in every detail, even to a motion picture theater in which the traveler may pleasantly pass the tedious in-between train time. The checking lobby, with the baggage and parcel check rooms, the barber shop, the travelers' and first aid rooms, the public telephone booths and the men's and women's rooms along the two sides, leads into the spacious station concourse and waiting room from the rear of the rotunda. This concourse, 80 feet wide and 500 feet long, extends above and across the train platforms, access to which is gained by both ramps and stair-

Pedestrians' entrance from incoming vehicular ramp. The entrance, windows, grilles and lighting fixtures are fabricated from light aluminum alloys.

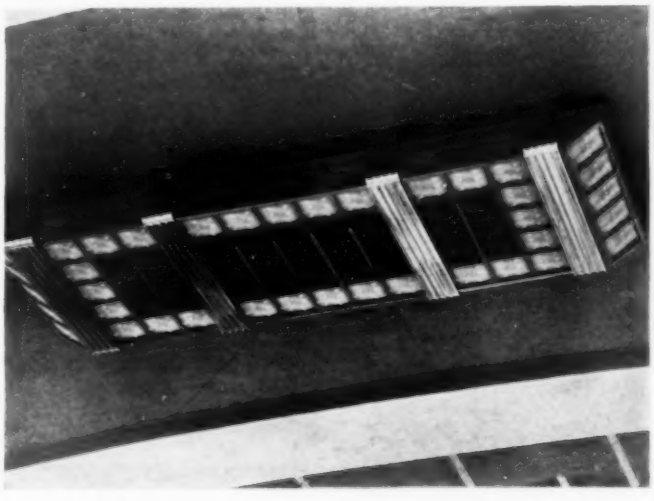
Soffet to vehicular tunnel beneath parkway. The aluminum work is fabricated entirely of stock sections.



Johnston & Johnston

Outgoing vehicular entrance with pedestrians' ramp on each side.

The station concourse: aluminum, mosaics, red verona marble and various shades of terrazzo.



Lighting fixture and ventilating grille, in station concourse. Fabricated of aluminum sheet, small channels, angle and tee sections, extruded shapes and sand castings.

Johnston & Johnston

Benches, chairs and tables in station concourse.

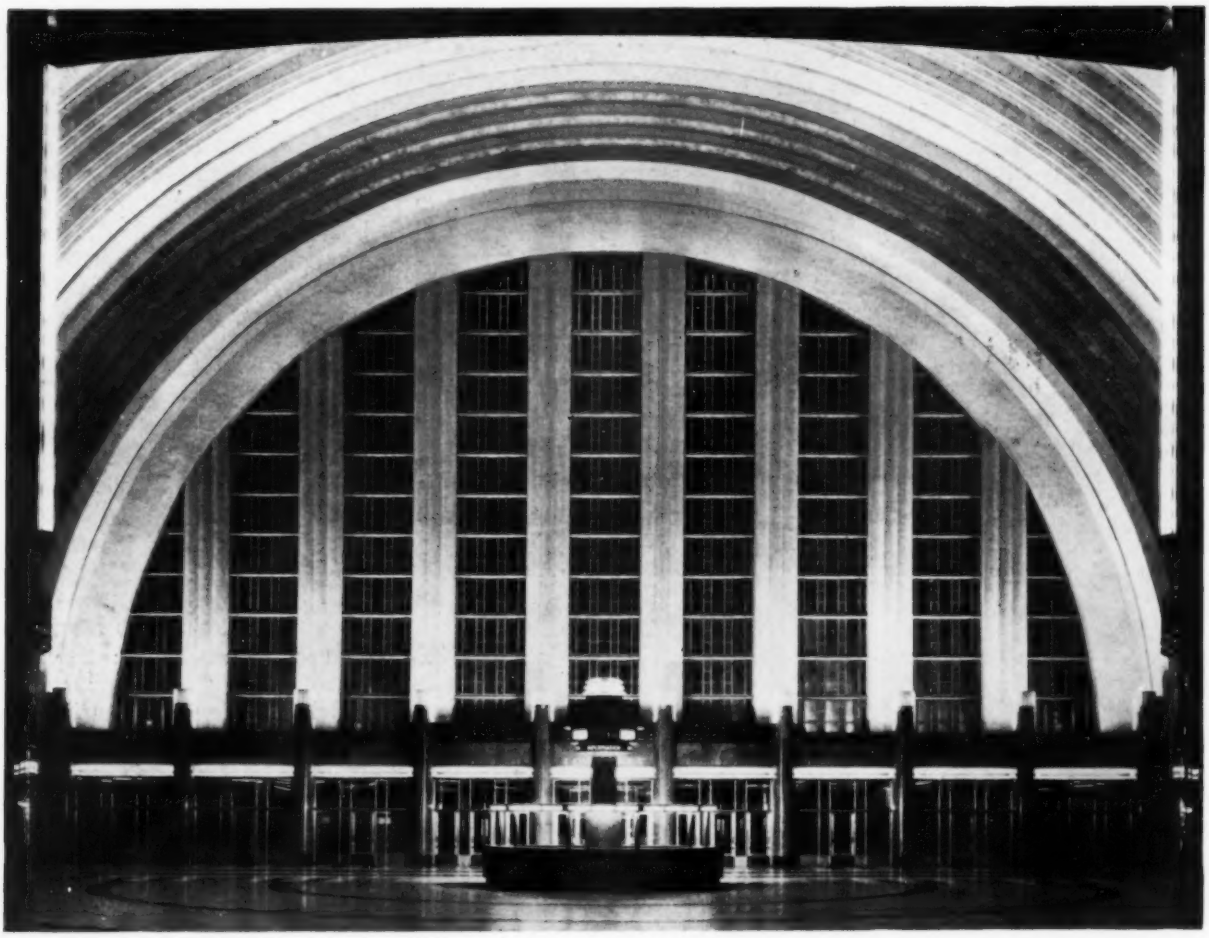
ways. At the present time, fourteen tracks are in use, but space is provided for two additional tracks, making possible the accommodation of 216 trains every 24 hours.

The interior treatment of the station is colorful. Instead of the funereal somberness so common in the decorative scheme of railroad stations, Cincinnati's new terminal is bright and gay.

The red verona marble side walls of the rotunda, checking lobby and station concourse are adorned by 23 large panels done in brilliant glass mosaics. These panels, an innovation in station decoration, depict the development of transportation and symbolize the various industries for which Cincinnati is famed. The ceilings of the station are painted in bright cool shades.

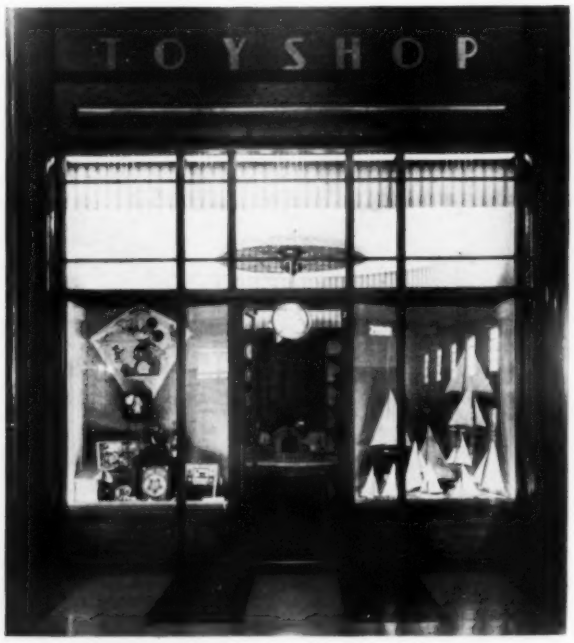
The colorful gaiety of the interior is accentuated through the use of aluminum in the fabrication of practically all of the metalwork: the vestibules and concession fronts, the ticket windows and grilles, the interior trim and joint filler strips between the marble blocks, the radiator and ventilator grilles, the lighting fixtures and clocks, the railings and gates, many of the windows and window sills, and all of the metal doors, transom bars and door frames on the main floor. The metal is also employed in the construction of the marquees and the hands and face of the 16-foot clock above the main entrance.

Simple forms, such as plates, bar stock, tubing, extruded shapes and comparatively plain castings, carry the decorative note of the motif. There is nothing ornate or fanciful in the design—graceful lines and curves, such as are depicted in the accompanying plates, combine to produce a pleasing effect. To impart additional character to the marble work, extruded aluminum screeds are employed throughout the entire building.



Rotunda looking towards main entrance. Aluminum in the windows, concession fronts and main entrance accentuates the colorful interior.

CINCINNATI UNION TERMINAL
FELLHEIMER AND WAGNER, ARCHITECTS

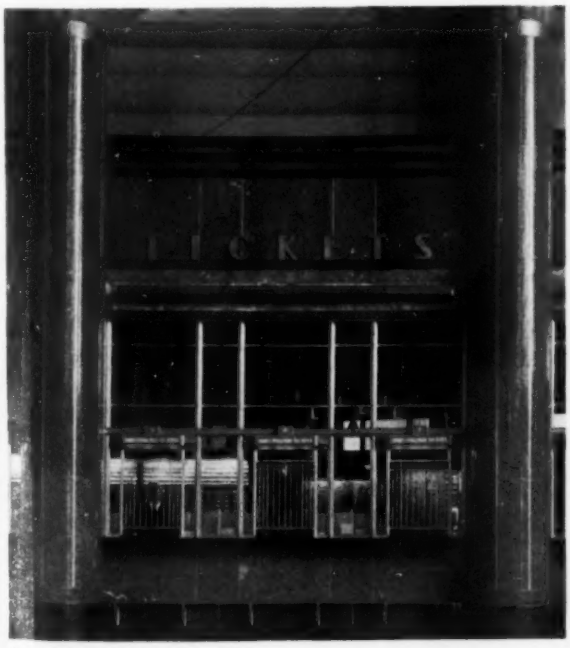


Johnston & Johnston

Toy shop in rotunda. Aluminum is used in various forms in the construction of all concession fronts.

Rotunda, looking towards station concourse: brilliant mosaics, a bright colored ceiling, red verona marble, and metalwork in aluminum.

CINCINNATI UNION TERMINAL
FELLHEIMER AND WAGNER, ARCHITECTS



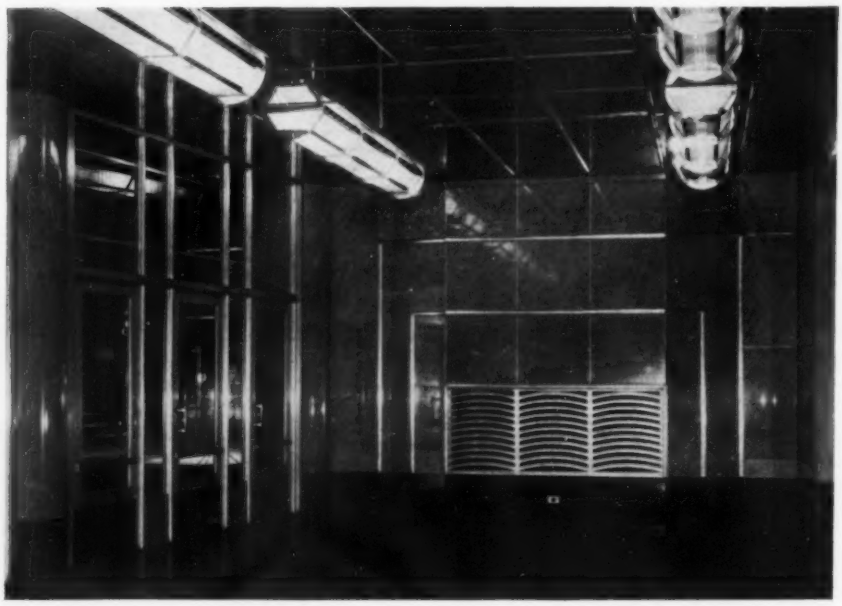
Johnston & Johnston

Ticket windows in rotunda. Metalwork is aluminum formed from sheet, bar, extruded shapes and castings.

Typical entrance to train platform. Except for the hardware, all metal details are executed in aluminum.

Johnston & Johnston

CINCINNATI UNION TERMINAL
FELLHEIMER AND WAGNER
ARCHITECTS



Main entrance vestibule. With the exception of the door hardware, all metalwork is aluminum.

Train announcing board in station concourse: Deplated and highlighted aluminum castings, bar stock, sheet, tubing and extruded sections.

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CINCINNATI UNION TERMINAL
FELLHEIMER AND WAGNER
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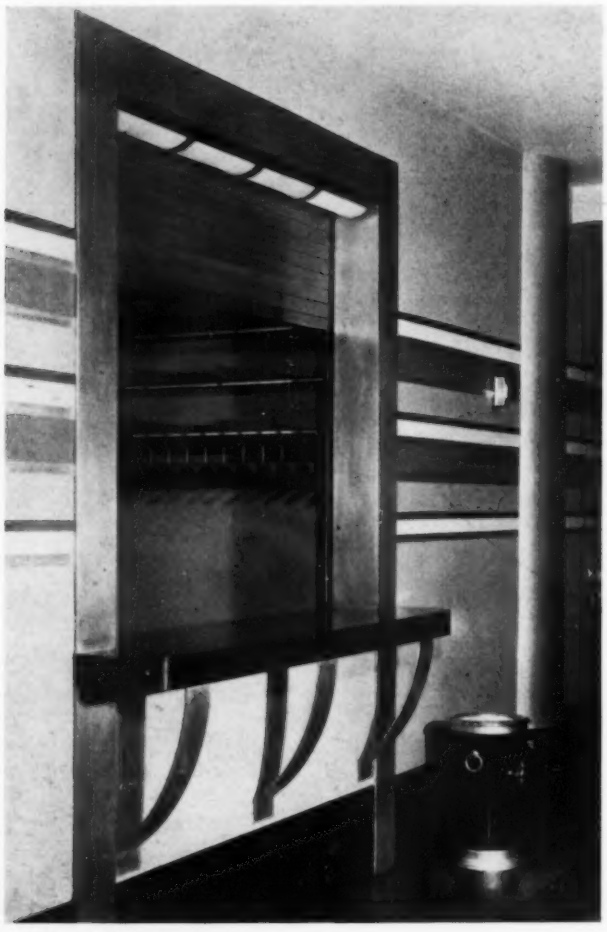
Entrance to women's room looking towards checking lobby: aluminum and wood and glass.



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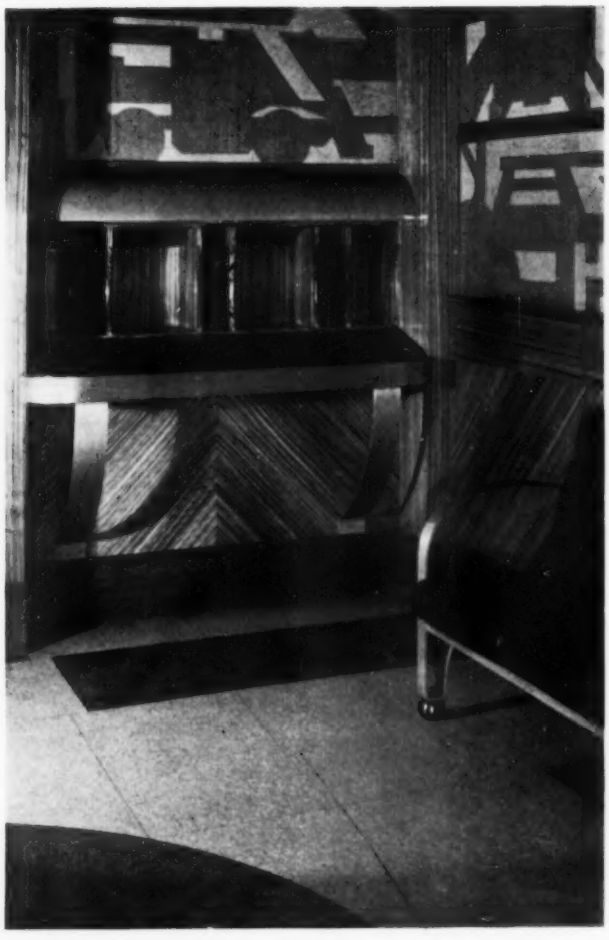
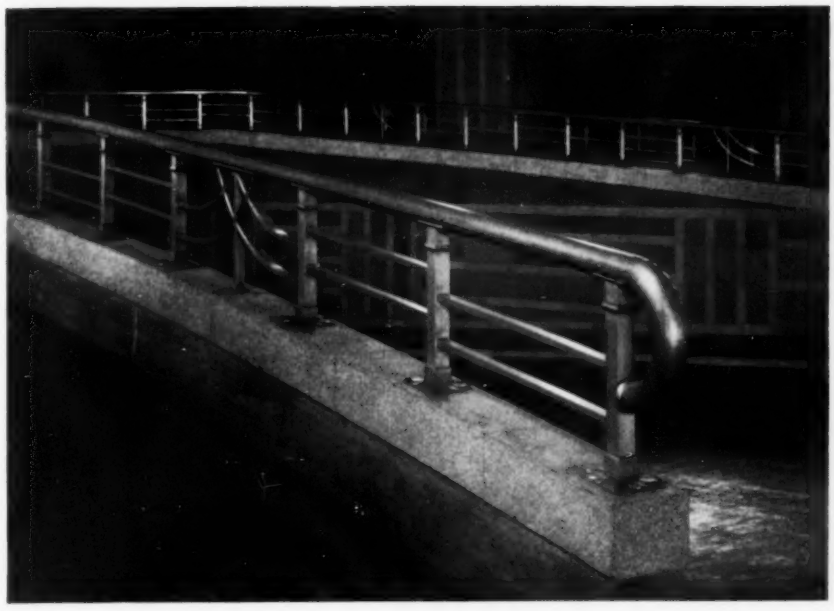
Check booth for private dining rooms.



Telephone shelf and waiting bench in men's room.

Telephone booths and employees' entrance to lunch counter and storage space at lower end of concourse. The doors are formed from rectangular aluminum tubing; the jambs and casings, from aluminum sheet. Aluminum bar, sheet and angles are employed in the lighting fixture and lettering, while the stand is trimmed with aluminum bar stock.



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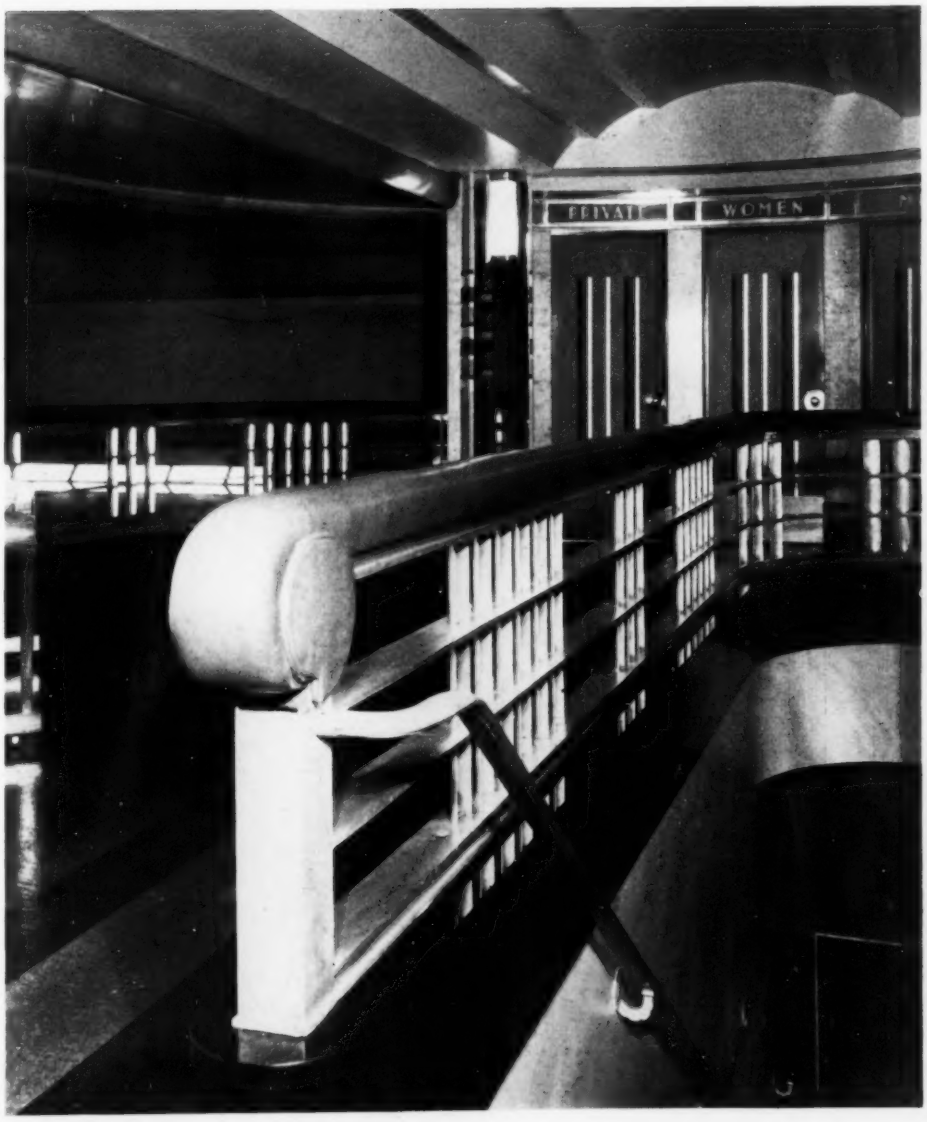
Railing on incoming vehicular entrance. Formed from stock sections of aluminum bar and tubing. The shoes and caps are aluminum castings.



Railing around well, stair and balcony railing leading to private dining rooms. The stair railing is extruded aluminum, reinforced by cast aluminum brackets. The other railings are formed from channel sections and bar with a tubular aluminum newel post. Blue leather is applied as a final finish to the top member, also formed from aluminum channels.

Opening between concourse and lobby to stairs and elevator. The flush panel door is formed from aluminum sheet and channel sections, the lighting fixtures from aluminum sheet.

Johnston & Johnston

The president's office, The Cincinnati Union Terminal Company: wood, cork, leather and aluminum.

INSULATION PROPERTIES OF ALUMINUM FOIL

By THEO. F. ROCKWELL, Instructor in Heating and Ventilating
Carnegie Institute of Technology

The resistance to the transfer of heat offered by aluminum foil lies mainly in its bright surfaces. These surfaces neither absorb nor emit radiant heat as readily as the surfaces of the more common building materials. Independent investigations at the University of Minnesota (1) and the Aluminum Company of America Research Laboratory (2) indicate that at the mean temperature range encountered in building walls, aluminum foil has a surface conductance between .7 and .8 B.t.u./sq. ft. hr./°F. This may be compared with the average conductance for other building materials of 1.65 B.t.u./sq. ft./hr./°F. (1) and (3).

Use of Aluminum Foil

This foil may be used in several ways as a heat insulation medium in the construction of buildings, but obviously it will be most effective when both surfaces are exposed to the air.

1. The foil may be placed between the sheathing and the external veneer; but if it is, it cannot be credited with any heat resisting property. It becomes merely an expensive form of windstop.

2. The foil may be attached to the studs or framing members before the sheathing or plaster base is placed. With this method of installation one surface of each strip of foil becomes available for resisting the transfer of heat. (If the foil be placed underneath the sheathing, additional building paper is not necessary as a windstop.) The resistance added to the wall amounts to $\frac{1}{.75} - \frac{1}{1.65}$ = 1.33 — .61 = .72 units for each exposed surface.

3. The foil may be pasted to one side of rigid insulation boards which may be used either as sheathing or plaster base with the foil on the air space side. The additional resistance is the same as for case 2.

4. The foil may be installed in the air space in walls in the same manner as flexible insulation material is installed, thereby forming an additional air space. The added resistance would then be $\frac{2}{.75}$ or 2.66 for each strip of foil. Additional strips of foil may be installed in this manner to form a series of air spaces separated by foil screens. The optimum spacing appears to be .30 inch (4).

The present price of this material is about 2.0c per square foot to apply it according to method 2. If one thickness is applied between the sheathing and studs, the building paper may be eliminated making the net cost of the additional resistance about 1.5c per square foot. The cost of the added resistance per 100 units is then (.015 ÷ .72)100 = $2.08. Applying foil between the plaster base and the studs would add 2.5c per square foot to the cost of the wall and the cost of this resistance would be $3.47 per 100 units. A comparison of these results with Tables III and IV in *The Selection of Building Insulation* does not indicate that aluminum foil installed in this manner is the cheapest way to insulate a house.

To install the foil according to method 4 would cost about 4.5c per square foot. The added resistance would then cost (.045 ÷ 2.66) 100 = $1.69 per 100 units. This indicates that this type of construction compares favorably with other types of construction.

Aluminum foil owes its high resistance to the bright luster of its surfaces and it is therefore essential that this luster be maintained. At present reasonable doubt exists as to whether the foil will retain its bright surface after a long period of years in a building wall.

Other advantages of aluminum foil as an insulating material are:

1. Fireproofness.
2. Vermin resistance.
3. No capillary absorption of water.
4. Low density.

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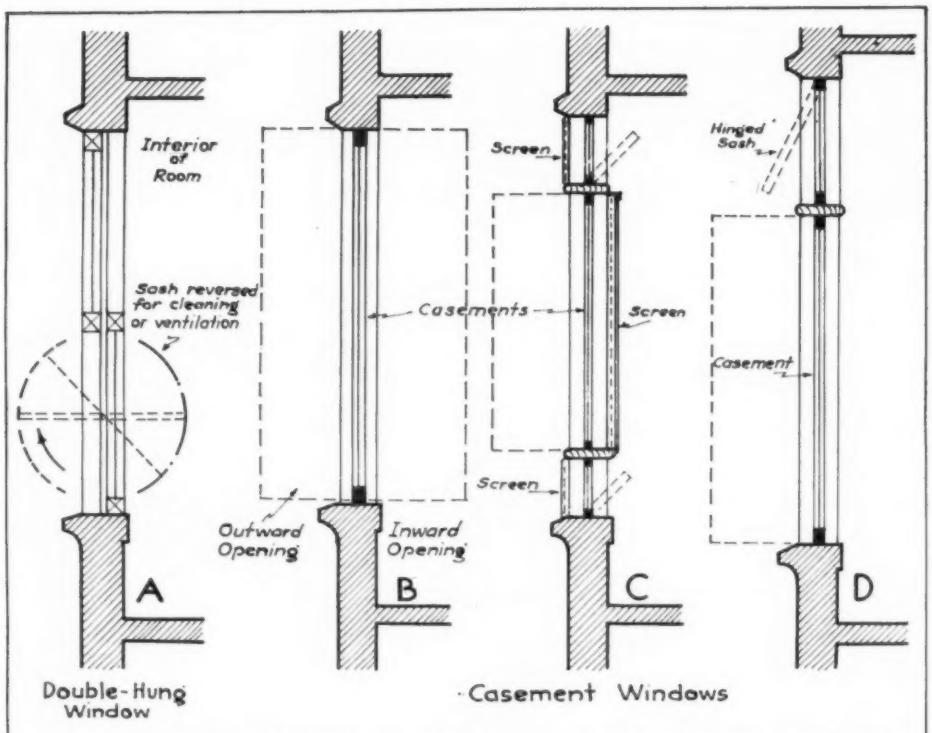


Figure 1 – DOUBLE-HUNG AND CASEMENT WINDOWS

WINDOWS FOR RESIDENTIAL, PUBLIC AND COMMERCIAL BUILDINGS

By E. E. R. TRATMAN, Civil Engineer

For residences and commercial and public buildings, taken as a whole, two types of windows represent probably 80 or 90 per cent of the window construction. These two types are (1) the familiar double-hung, vertically-sliding counterweighted sash; and (2) the hinged, horizontally-swinging casement sash. The former has by far the larger proportion, since it is applicable to and is used in buildings of every class, while the latter is of more restricted application. Projected, folding or pivoted windows of various designs, which swing vertically—or horizontally in exceptional cases—represent the remaining 10 to 20 per cent of windows.

Under commercial and public buildings may be included office buildings, hotels, banks, schools, hospitals and libraries; also the larger class of apartment buildings. Residences include the smaller apartments and every class of private or individual residence, from the largest and most costly to the cottages and bungalows of subdivision developments.

In large and multistory buildings a considerable degree of uniformity in arrangement, size and style of windows is inevitable. In residence design, the arrangement, size and style of windows depend upon the layout of the rooms, the type of architecture, and the preferences of the architect.

While window design for commercial buildings shows a distinct trend towards larger sizes and a greater proportion of the total wall area, there cannot be said to be any really definite trend in window design for residence buildings. This is due to the fact that the requirements are different, and that the window design is governed so largely by the architectural design. Since each residence building is an individual design—multiple or mass design and construction of residences not having yet reached the practical stage—window design is affected by the same condition of individuality. However, the increasing use of casement windows indicates an apparently established practice. The double-hung and casement types are practically universal for residences. But whether the windows are to be large or small, and whether they are to have large or small panes or lights, are matters dependent almost entirely upon the architect of each structure. All window manufacturers have numerous varieties of standard or ready-made designs, adapted to various conditions. But very frequently windows are made to special designs and specifications prepared by the architect, this being especially the case for high-class and expensive residences.

Modern residence design experiences changes in fashion which appear, thrive for a time and then

disappear. These changes in style affect window types and details as well as other features in building design. Such special designs or styles, however, are rarely of general application. Some architects have introduced horizontal fenestration in several of their buildings; that is, the windows are grouped to form a considerable length of glazed area, unbroken by wall surfaces. Other architects have followed certain foreign designs in carrying their windows practically to the level of the ceiling. In the so-called "modernistic" building designs there is some tendency to the introduction of this feature. Its original purpose, presumably, was to get a penetration or diffusion of the light further back into the room. This effect seems to be of small importance practically, and is nullified if the usual shades and drapes are used, since they will cover the top of the window. However, appearance rather than any useful effect is evidently the reason for the present occasional adoption of such windows. Many architects advocate, as a general rule, making the tops of the windows level with the tops of the doors, but in very many cases the windows are somewhat higher than the doors.

Selection of Windows

In residence design, the selection of type of window is governed largely or mainly by the style of architecture in each case. For example, the double-hung window is suitable for Colonial and American styles, but not for French or early-English styles. In the same way, casements are particularly suitable for the latter two styles. But casements are used extensively also in apartments of the studio class and in residences of modern "American" designs which follow no precedents or styles or traditions. Points to be considered in the selection of types of windows in any case are the architectural design, class of occupancy, interior treatment and decoration, light and ventilation requirements, cost and maintenance expenses, ease and reliability of operation, weatherproof and fireproof qualities, and facilities for screening, shading and draping.

Double-Hung Windows

It is of special interest to note the very general favor given by architects to double-hung windows as an "all-around" type, suitable under a wide variety of architectural and practical conditions. Advantages cited in individual statements include: trouble-proofness, ease of shading, draping and screening; ease of operation; airtightness and watertightness; low upkeep cost; "the most practical and satisfactory for general use," and the general familiarity to owners, tenants and others who have to use and operate the windows. The one objection offered is that only 50 per cent of the area of a double-hung window is available for ventilation. This condition applies only to rooms used for large groups of people, more especially in schools. The typical construction of a double-hung window is shown diagrammatically at A in Fig. 1.

Casements and some types of projected windows are favored for the two advantages of larger ventilation space and easier cleaning. In respect of cleaning, however, the advantage is rather doubtful, since many windows of these types include fixed portions above or around the movable sash and are not easy of access.

Both double-hung and casement windows are entirely satisfactory in appearance and operation if properly detailed and made. Bad examples of either type constitute no arguments against that type. Pivoted or projected sash are seldom used in residential buildings, partly from unsuitability to architectural considerations, and largely owing to difficult problems of adapting screens, shades and curtains or hangings. In a single-hung window, as used occasionally for architectural effect, only the lower sash is movable and counterweighted. The upper and fixed sash is then likely to be of ornamental design.

The wide approval of the double-hung type of window for commercial buildings is shown in an article on "Windows for Commercial Buildings," by the writer published in *Engineering News-Record*, August 25, 1932. After pointing out that large window openings and large window areas in proportion to wall areas are characteristic of modern building design and have led to numerous developments in window construction, particularly in a variety of designs of pivoted and swinging sash as alternatives for the ordinary double-hung vertically-sliding sash, the situation was outlined as follows:

"That the double-hung sliding sash type of window continues to be used to a much larger extent than any of the substitute types is an interesting and significant fact attested to by architects in general, indicating the practical value of this type and the possibility of its development to meet modern conditions and requirements. In fact, a canvass of a large number of leading architects specializing in public, semi-public and commercial structures shows practical unanimity of opinion that the double-hung sliding-sash type is the most widely used and the best all-around type of window today. One of the largest architectural firms states that this type of window is provided in 99 per cent of the buildings designed by this firm. Other types of windows have advantages of their own, of course, but have by no means superseded the double-hung type. Such other types are used largely under special conditions, such as: (1) greater suitability to certain architectural designs, or to certain interior arrangements or occupancy; (2) requirements for large ventilating area, particularly in schools and hospitals, since the ordinary sliding-sash type limits this area to about 50 per cent of the area of window opening; (3) where very large units are desirable, as for public offices and libraries, studios and upper-story showrooms. As to this last condition, however, double-hung sliding-sash windows are often provided in very large units."

Reversible Windows

With the double-hung windows so universally favored and so widely used, it is natural that attention should have been given to methods of eliminating its main objection as to restricted ventilation area and methods of facilitating the cleaning of the outside surface. In a construction rather extensively used for schools, hospitals and other institutions, and also for hotels and office buildings, pivots or trunnion bearings are provided at the mid-height of each sash so that it can be revolved as well as moved vertically in the window frame. This is shown by dotted lines in the drawing of the double-hung window A, Fig. 1.

With both sash turned to a horizontal position, practically the entire window area is open for ventilation. By turning the sash completely over, or reversing it, the outside can be cleaned within the room. For cleaning the upper sash, it is lowered, while the bottom sash is raised. Thus all cleaning is done within the room and at floor levels, and the window is open only during the brief period of reversing the sash. Furthermore, by tilting the sash to any desired angle, the ventilation can be regulated more effectively than by vertical adjustment of the sliding sash.

A type of reversible window adapted particularly for school buildings has both sash pivoted in the frame, but without the sliding movement of a double-hung window. In this way, all cords, chains, pulleys and weights are eliminated and a very simple frame is used, thus reducing the cost materially. For regulating ventilation, the sash may be set at any angle, deflecting the air upward. For cleaning, the sash are reversed, as described above, but a ladder or step-ladder will be required in cleaning the reversed top sash. Either type can be fitted with weather-stripping. Flat screens on the outside may be hinged at the top and arranged to swing far enough outward to clear the bottom sash when in its horizontal position.

Among other forms of reversible windows are some of the projected type, noted later. In these the sash slide in the frame, instead of revolving on side trunnions, their movements being controlled by arms attached to the sash and the window frame. With this construction, the weights, cords and pulleys of the double-hung reversible window are eliminated. For outward-opening sash of this kind, special inside screens are used, but the inward opening sash may have the ordinary outside screens.

Casement Windows

The swinging sash of casement windows have an advantage over the double-hung type in facility of cleaning the outer surfaces, the hinges being of such construction that as the sash opens it slides or swings clear of the frame, leaving an opening of sufficient width for the cleaner's arm. If combined with fixed sash, however, this advantage is minimized. With the sash fully swung, the entire casement area is open for ventilation. The sash can be set and locked at any desired position. When combined with horizontally-swinging sash above and below the casement, as is frequently the case, there is opportunity for considerable control of the ventilation. When fixed sash or transoms are placed above the casement they may reduce the effective ventilation by trapping the air above the casement opening.

Some typical arrangements of casement windows are illustrated in Fig. 1 by the drawings B, C and D. The window at B is a plain casement, with both inward and outward opening sash indicated, but the latter arrangement is used in the great majority of cases. At C, the casement is supplemented by a movable transom above and a movable ventilator below, with screens applied to the three openings. The combination at D, as used in lofty rooms, has a tall casement coming near the floor level and surmounted by a high sash hinged for ventilation and opening outward.

Although casements are used extensively in public and institutional buildings, they are not always regarded favorably by the occupants or managing staff. When proposed for hospitals, the medical staff has sometimes objected to the admission of fresh (or cold) air by means of vertical openings. Drafts from partly open double-hung windows can be prevented to a large extent by glass or metal deflectors placed inside at the bottom, such as are commonly provided in office buildings.

At some charitable and correctional institutions also, the managements have raised objections to casements on the score of difficulty in effectively and economically guarding and screening them. To meet the guarding condition, a restricted travel or opening of the sash has been devised, to prevent accident, suicide or escape, without the necessity of providing fixed bars or gratings. But for institutions in general the managements often prefer the double-hung sash as being more secure, more "foolproof" in operation, less expensive in cost and maintenance, and causing less trouble in shading and screening.

The ventilation difficulty noted has been overcome in some cases, such as hospital operating rooms, by placing a fixed glass partition about two feet from the inside of the window, the fresh air then entering through a screened grille which covers the space between the window frame and the partition. With a radiator below this space, the incoming air may be warmed. But unless some part of the partition itself can be opened, there will be no opportunity for free ventilation to sweep out foul air and odors. Such complicated window arrangements are costly, and would be used only under special conditions warranting their cost.

Casements open outward, as a rule. Inward-opening casements have been used, partly on account of the simplicity of placing outside screens. Their cleaning also is a simple matter, but they take up valuable space, are likely to interfere with furniture, and constitute a difficulty in the arrange-

ment of curtains and draping. In some cases, a light curtain or roller shade is hung on each inward-swinging leaf, the side draping then being arranged in much the same way as with outward-opening casements. With the development of appliances by which outward-opening casements can be operated without interference from the inside screen, this outward-opening arrangement has become general. It is generally considered to be more weather-tight, it does not interfere with the interior draping, and it is generally preferred for residences by owners and tenants.

The only objection to outward-opening casement sash appears to be the difficulty of operating against high winds. This objection has been overcome, however, by means of appliances with which the sash can be moved easily and held securely in any position, even during a high wind. Casement sash for residences rarely exceed 5 feet in height and 2 feet in width. With much larger sash, 6 feet or even 8 feet high, as used in some commercial and public buildings, or under special conditions in large residences, outward-opening casements might present some difficulties during severe storms. But such large sash are usually equipped with additional or special fastenings, and they may have operating mechanism connected at both top and bottom, thus holding the sash firmly in any position and preventing sway or rattling. Self-cleaning hinges, secure fastenings, and a construction that will be free from warping or distortion are features essential for permanent weather-tightness and convenience of operation of casement windows.

Pivoted or Swinging Windows

Pivoted windows, with the sash swinging vertically or horizontally on fixed pivots or trunnion bearings, are confined mainly to special conditions, and are rarely applied in residence buildings. Large sash pivoted at top and bottom have been used to a limited extent in offices. In lofty rooms, casement sash is sometimes supplemented by top sash which is pivoted either at mid-height or at the top rail, as shown at D, in Fig. 1. An example of pivoted sash is the combination of horizontally-swinging and vertically-swinging sash shown in Fig. 2, which is used in the large windows of a public building. No screens or drapes or curtains are used in this particular case.

Two arrangements of large pivoted sash, which have been used only on a very limited scale, are shown in Fig. 3. The window at E has the sash so hung on side pivots or bearings that the top swings outward and the bottom inward, although the opposite arrangement would seem to be the more convenient. In the window at F, the sash is pivoted at top and bottom, the right-hand side swinging outward and the left side swinging inward. Any type of sash that swings partly in and partly out is likely to be a problem for screening, shading and draping. In addition, both the types shown in Fig. 3 are sure to give trouble with furniture arrangements and usage of the room.

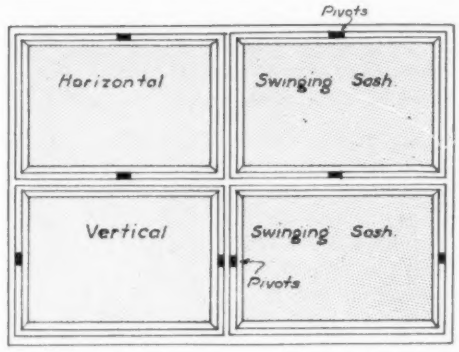


Figure 2
LARGE WINDOW WITH FOUR PIVOTED SASH

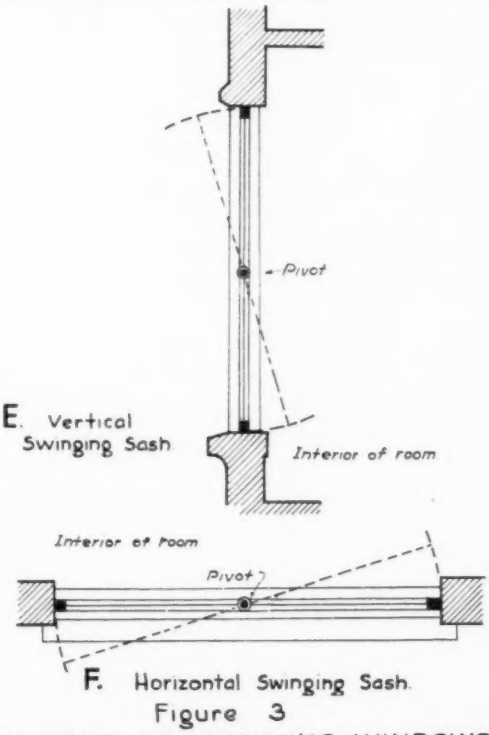


Figure 3
PIVOTED OR SWINGING WINDOWS

Projected Windows

In what are termed "projected" windows, the movable sash do not swing on fixed pivots, but have side shoes which slide in fixed vertical guides in the window frames, the swinging movement being controlled by side arms pivoted to the sash and the window frame. These windows are composed usually of a series of horizontal sections, all or only some of which may be movable, but the movable sections are usually linked or connected together so as to operate as a unit.

Typical arrangements of projected windows are shown by Fig. 4. In that at G, there are three sec-

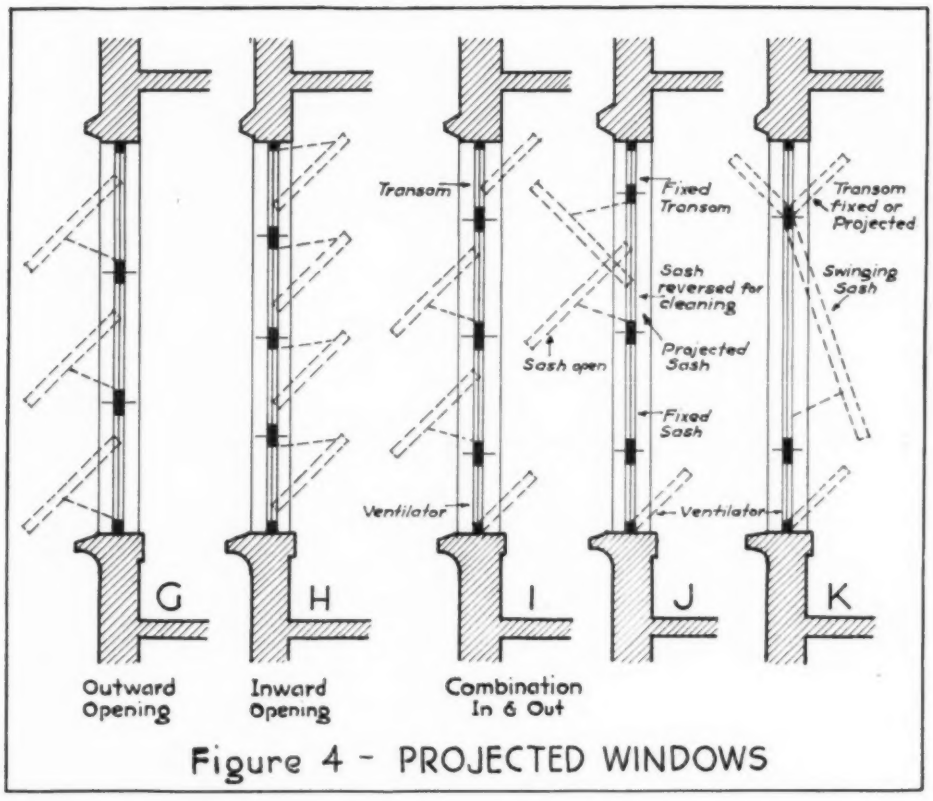


Figure 4 - PROJECTED WINDOWS

tions of sash opening outward in such a way as to protect the openings from draft and entrance of rain. At H, the window has four sections, all opening inward and directing the air upward, although a deflector may be needed for the bottom opening. The window at I has two sections of projected sash, with a ventilating section below and a movable transom above. At J, there is a combination of fixed and projected sash, with ventilator at bottom and a fixed transom over the top. Finally, at K is shown a top-hinged swinging sash in combination with a transom of the projected type and a bottom ventilator section.

For projected sash in which the bottom rail moves outward, the top rail slides down in the guides. Sash in which the top moves inward, has the bottom rail sliding upward in the guides. This will be seen from the drawings. For cleaning the outside surface from within the room, the sash may be reversed, as is indicated by the position shown in dotted lines on the window J in Fig. 4.

Windows of the projected type are made with innumerable variations and combinations of fixed and movable sash. The open sash shed rain and regulate ventilation, and may be fitted with individual roller shades. In one arrangement, designed particularly for schools and hospitals, the bottom section can be disconnected and kept closed, while the upper sections are more or less open. In this way direct draft into the room is prevented.

Other Window Types

A folding or projected window composed of two vertical sash sections, shown in Fig. 5, is a unique arrangement which has been applied in office buildings, schools and hospitals. In this design, the outer or jamb rails of the sash slide in horizontal guides on the sill and the top of the frame, while the meeting rails move outward in a straight line. Inside screens can be used. The swinging window shown at K in Fig. 4 is also an unusual arrangement. For sun parlors and sun porches there is occasional use of horizontally-sliding sash, operating somewhat like double-hung sash turned sideways, but without the necessity of counterweights and chains.

Miscellaneous Buildings

Industrial buildings, such as mills, warehouses, factories, machine shops and manufacturing establishments, have not been included in this study of windows. Nor does it cover ecclesiastical and collegiate structures, museums or art galleries. All these exceptions present conditions in window design and details which are quite different from those of residential and commercial buildings. Furthermore, windows of industrial buildings usually have only a limited relation to architectural design. Such buildings frequently have large areas of fixed steel sash, with pivoted or projected sections for ventilation. Casement, pivoted and projected types of windows are used in churches and collegiate buildings, but are usually of special design.

As far as stores of the important class are concerned, their windows, however large, are rarely of much value for interior lighting. Those of the first floor are shut off by partitions to serve as

show cases. Those on the upper floors are obstructed either directly by goods displayed in them, or indirectly by goods arranged about the room. For second-story show windows, the two arrangements illustrated by Fig. 6 have been used. At L, a large fixed central pane is flanked on each side by a single casement sash that is available for display and also for ventilation. At M, the central portion is somewhat smaller, but is flanked by a pair of double-sash casements.

For buildings of charitable and detention or correctional institutions, all the several types of windows are used, but the double-hung type is generally regarded with favor by the managements of such institutions, as noted already. Fixed steel sash of heavy construction may have pivoted or projected ventilating panels, opening upward and inward, and usually designed with muntins which correspond with the arrangement of the outside fixed bars. A screen may be fitted between the movable sash and the outer bars. In all designs, the travel of the sash or width of opening may be restricted by means of locked stops or locked operating mechanism to prevent escape as well as accidental or suicidal falls.

Windowless Buildings

Recognition of the fact that windows are inefficient for the lighting of floors occupied by goods, machinery or exhibits, while at the same time they reduce valuable wall space, has led to the design of practically windowless buildings for the Chicago World's Fair. Window areas may restrict exhibit space and many exhibits would necessarily block the windows, so that there would be poor distribution of light, with unavoidable dark or dim spaces and inadequate illumination for many of the exhibits. It was decided, therefore, to take the radical step of relying entirely upon interior electric lighting. Windowless manufacturing buildings have been constructed, and windowless office buildings proposed, on the basis of greater efficiency of work with constantly uniform light and regulated ventilation. But these cases are so few and exceptional as to need only passing mention here.

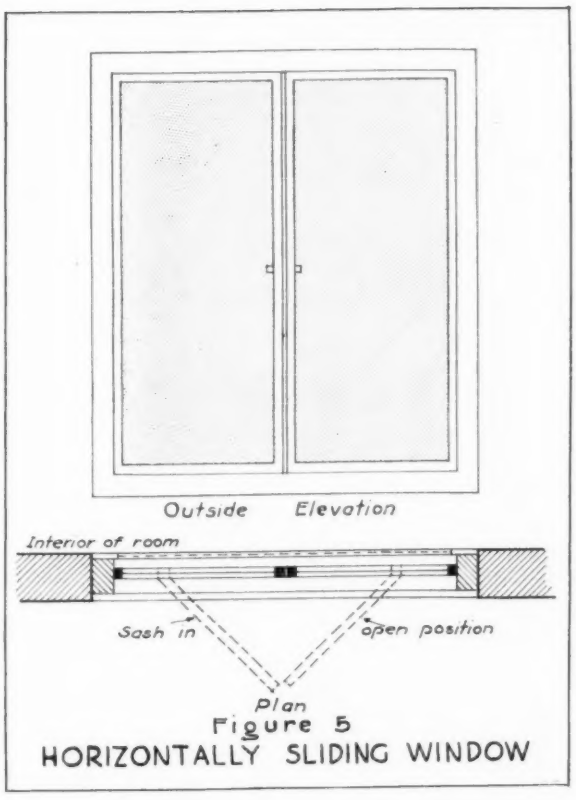


Figure 5
HORIZONTALLY SLIDING WINDOW

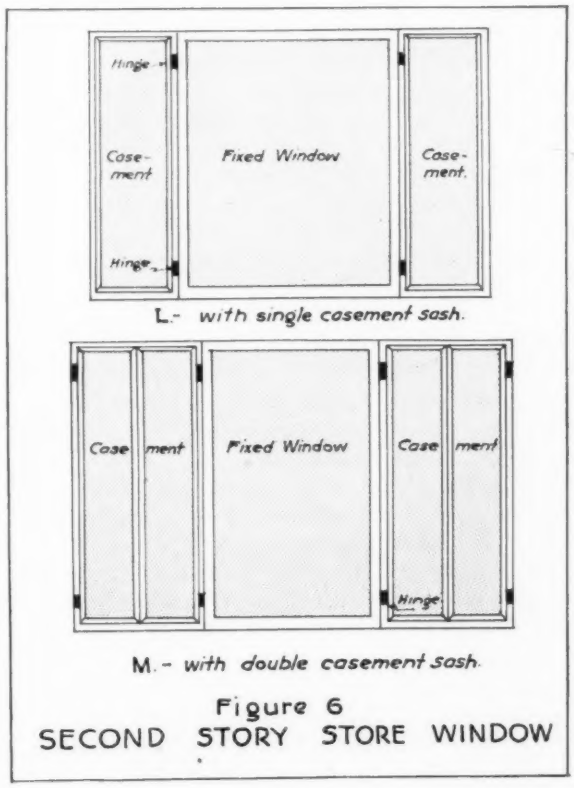


Figure 6
SECOND STORY STORE WINDOW

WOOD AND METAL WINDOWS

Besides comparisons of types of windows, as reviewed in the preceding discussion, there are comparisons of materials: wood or metal. The former includes various species and qualities. The latter includes hollow and solid rolled steel, pressed steel, bronze and aluminum, separately or in various combinations. Most windows of the projected type are of metal, while both wood and metal are used for other types.

Since the double-hung type of window is so largely in the majority, the manufacturers of metal windows have naturally invaded the field formerly occupied almost exclusively by the manufacturers of wood sash. Although metal windows of this type are of comparatively recent introduction they

have met with wide approval for such structures as offices, hotels and public buildings. In fact, the ordinances of certain cities require metal construction in tall or multistory buildings. Even where wood double-hung windows are used in large buildings, metal construction is sometimes used for windows having fire exposure. A high degree of fire resistance with metal sash and wire glass has been indicated by numerous fire tests.

For residences, metal windows are in increasing use, although estimated at only 5 to 10 per cent of all windows in new construction. Their main use has been in the more expensive class of residence. They have been adapted also to the small cottage and bungalow class, but appear not yet able to compete with wood in price, except in particular cases. In practically all cases, the metal windows for residences are of the casement type. Casements of all classes are more generally of metal, but wood construction is also available. Metal casements are estimated by some architects to be used in 60 to 70 per cent of residences costing more than $20,000 and in 40 to 50 per cent of those costing less than that amount. These figures apply only to buildings of styles for which casements are suitable. A manufacturer's estimate is that metal casements represent 25 per cent of windows in new residential buildings in large cities and as high as 75 per cent for apartment-house construction in New York City, while only 30 per cent of the total manufactured metal window production in 1930 was in buildings of the residence class.

Application of metal construction to the smaller and cheaper classes of residences involves the problem of attaining a sufficiently low cost with a construction that will be permanently serviceable, weathertight and effective in operation. With very light construction there is likely to be warping and distortion of parts, with the result that windows will not open or close easily and when closed will permit excessive entrance of cold air or escape of warm air. An uncomfortable house with high fuel cost will be the outcome. These points need to be considered carefully by architects and manufacturers if low-cost buildings are to be a successful field for the metal window.

Little attention has been given to the residence field by some manufacturers of metal windows for the obvious reason that larger structures are much more attractive from both sales and production standpoint. However, this field is now being prospected and cultivated to an increasing extent.

Weathertightness

As to the weatherproof qualities of windows, manufacturers of both wood and metal windows have made this factor a strong talking point in favor of their own productions. The former argue that warping of metal and ineffective setting in masonry will cause much air leakage. The latter claim the same results from wood shrinkage and decay. A point not often mentioned, however, is that wood sash usually has wider contact surfaces than metal. This is offset to some extent by overlapping contact surfaces of metal, drawn close together by cam action of the fastening or locking devices. Decay of wood is not often a serious trouble, while there is the possibility of using treated wood. In many old buildings the wood sash and frame are still quite sound, effective, easy to operate and sufficiently weathertight.

Modern metal construction appears to disprove the general argument against it, since its parts are substantial enough to be free from warping or distortion, and the metal does not shrink. Furthermore, the joint between the metal frame and the masonry is usually calked with plastic material that will maintain a permanently tight joint or closure. On the other hand, there probably is some greater loss of interior heat during cold weather, since the metal is a better conductor of heat. In hot weather, the metal area is too small to have much influence on the interior temperature. There may be a little difficulty in making a fairly tight sliding joint with metal to metal, especially where the surfaces are narrower than with wood. But metal weatherstripping is sometimes built into metal sash in order to make a tight joint and prevent rattling.

Arguments on Both Sides

The fact of the matter is that both wood and metal construction are good and satisfactory, provided they are of good design, material and workmanship. In consequence, the two types are directly competitive. But in competitive arguments, the latest developments and improvements in the opposed type are likely to be ignored, while stress is laid upon defects or faulty features in earlier designs as being typical, although in fact they may have been minimized or eliminated. In reality, both are good; each one has certain points or advantages, and also certain disadvantages. To a considerable extent, the value and efficiency are dependent upon the quality of construction. Light frames and sash in any material are likely to result in shrinkage, warping and distortion, with consequent reduction in weathertight property as well as in efficiency of operating mechanism and fastenings. Substantial construction in any material will reduce or eliminate such troubles.

With metal, there may be some condensation, the cool surface condensing the moisture in the air of the room. Metal may also require more painting than wood, but modern methods of baking the paint or of applying a protective coating upon the metal increase the durability of this coating. Welded construction of metal sash and frames is an aid to their strength and their resistance to distortion. Repairs or adjustments to metal after distortion or displacement are difficult to make, even by a skilled ironworker, while a local carpenter can usually rectify defects in wood construction. As a rule broken panes also are replaced more easily in wood than in metal sash.

A common claim against wood is that the sash parts are thicker than those of metal windows, and are thus somewhat obstructive or obtrusive. This is not necessarily the case. Where the sash has no muntins, the difference is negligible. Even if there are muntins, they may be light or heavy according to design, and narrow muntins are obtainable in regular practice. Metal casements are generally satisfactory, but metal double-hung sash have in some cases proved leaky as to air and rain, and difficult to keep in alignment.

Certain species of wood have not proved durable, rot occurring in both sash and frames. In some such cases the wood construction has been replaced with metal windows. On the other hand, metal windows have been replaced with wood in several cases, on account of leakage of air, rain and snow; difficulties in keeping the windows weathertight and in reglazing; also on account of continual maintenance expense and early corrosion. Such cases, usually involving special conditions, constitute no argument against either material. Metal construction is of comparatively recent introduction, but has already proved its value and efficiency. In many old buildings the original wood sash and frames are in excellent condition, both as to soundness of material, weathertightness and ease of operation.

Glazing

Casement windows for buildings of certain types of architecture have sash of small size and filled with small leaded lights, in imitation of old-style foreign practice. Modern ideas of owners and tenants, however, are generally favorable to large window areas and large lights for unobstructed view. In many modern buildings, therefore, each casement sash has but few panes or lights, and in fact may have but a single pane of glass of full size.

The size of lights in the sash has no relation, of course, to the type of window. Double-hung, casement or other sash may have any size or arrangement of lights, in accordance with the architect's ideas as conforming to his design of the building. In office and hotel buildings, large lights are usually preferred. In residences, the same principle is often followed; or one or both sash (usually the upper one) may be more or less subdivided by muntins. Furthermore, residences frequently have two or more types of windows, such as casements for the first floor and double-hung windows for the upper stories.

Against wood sash, objection has been made to the size of frames and sash members, as already noted, but among recent developments in wood window construction are muntins considerably thinner than those of ordinary make. On the other hand, in some windows, both metal and wood, the light is purposely dimmed or obstructed by small leaded lights or panes, in imitation of old-fashioned construction. To offset this again, is the opposite plan of using ever larger lights or panes, sometimes a single pane for a casement or double-hung sash.

In fact, there are two opposing forms of treatment in window design. The one is towards ample interior light, with large windows and large panes. This applies to residence, public and commercial buildings. The other is towards small windows and small panes, or small panes even for fairly large windows. This applies mainly to residences, but to some extent also to public buildings of architectural types for which such window design is appropriate.

Windows and Walls

With wider recognition of the practical and economic advantages of ample light in office work, there has come an increasing proportion of window space to wall area in office buildings. The window height being limited by the floors, the increase has been in horizontal development. This typical horizontal fenestration has reached a very high degree in the new McGraw-Hill building, New York, where the structural columns are practically the only vertical interruptions in the rows of windows and are indeed treated as mullions in the architectural design.

Even this high proportion of window or glazed area may be increased by special structural construction in which the outer columns are set back from the wall line, the floors being cantilevered beyond them. In this way the glazed area may be practically 100 per cent of the wall area. However, this cannot be classed as window construction, since it consists of fixed sash or framework with a certain amount of swinging sash for ventilation. It is rather glass wall construction. Although such construction has been used in some machine shops, stores and manufacturing buildings, it is quite exceptional and needs no more than passing reference. With it, some arrangement of shades or awnings will be desirable, as a rule, as protection against excessive glare and light in sunny weather.

For rooms in residences, a great amount of window area is rarely desirable, and, on the contrary, would be distinctly objectionable. An exception may be made in certain special apartments, such as sun rooms or sun porches, where horizontal fenestration is suitable and has been introduced successfully. Both casement and double-hung sash have been applied under such conditions, and there has been limited—or mainly experimental—use of horizontally-sliding sash. In special cases, windows of such rooms have been extended nearly to the ceiling level to insure a minimum obstruction to sunlight.

Window Cleaning

Safety and ease of cleaning the outside of the sash are talking points for certain types of windows which may be cleaned from inside the room, but it seems likely that these advantages are rather overestimated. Accidents do occur, of course, in clean-

ing from outside the building, but probably they are very few in proportion to the number of windows cleaned. Besides this, windows in which the movable sash can be cleaned from the inside are often combined with fixed sash above or at the side of the movable sash. The cleaning of such fixed sash must be done from the outside. This condition applies particularly to residences. For commercial buildings, the conditions were reviewed as follows in the article in *Engineering News-Record* which has already been mentioned. "Cost of window cleaning and the liability of injury to those engaged in washing the outside of ordinary sliding-sash windows, especially in tall buildings, are important considerations in many cases. Most types of swinging windows have a larger safety factor in this respect, and the possibility of equipping ordinary windows with devices enabling the sash to be reversed has been mentioned. It is stated that in the careful comparison (some years ago) of a hotel having sliding sash and its addition having reversible sash, it was found that the cost of washing the latter was about 35 per cent less than for the former, due specially to the quicker work. This difference may apply where the washing is done by employees. But inquiry of window-cleaning firms does not indicate that the type of window is a factor in the charges for cleaning. Uniform charges, however, may be due largely to the fact that comparatively few buildings of the class handled by such firms are equipped with any but the ordinary type of double-hung sliding sash."

Screening

The application of the usual insect-proof screens is a simple matter with double-hung windows. It is more complicated with swinging windows of any type, but the difficulties can be surmounted in different ways. For casements that open outward, which is the more usual arrangement, fixed screens may be placed on the inside, the mechanism for swinging the sash and holding it in any desired position being operated through the screen. In some cases, there is an outward swinging transom above the casement sash and an inward swinging transom between the casement and sill. These would have fixed screens fitted on the inside of the top transom and the outside of the bottom transom. Various forms of rolling screens, hinged screens and horizontally- and vertically-sliding screens are available to meet special conditions of window construction. They have advantages in giving access to the sash for occasional washing, which is not practicable with the ordinary fixed screens. Storm sash may be fitted in much the same way as fixed or hinged screens, some special means of attachment and adjustment being provided.

Window Hardware

As a final note, attention may be called to the great advances in window hardware that have been made in recent years, providing improved appearance, ease of operation, simplicity, strength, compactness, convenience and security.

MATERIAL PRICE MEASURING ROD*

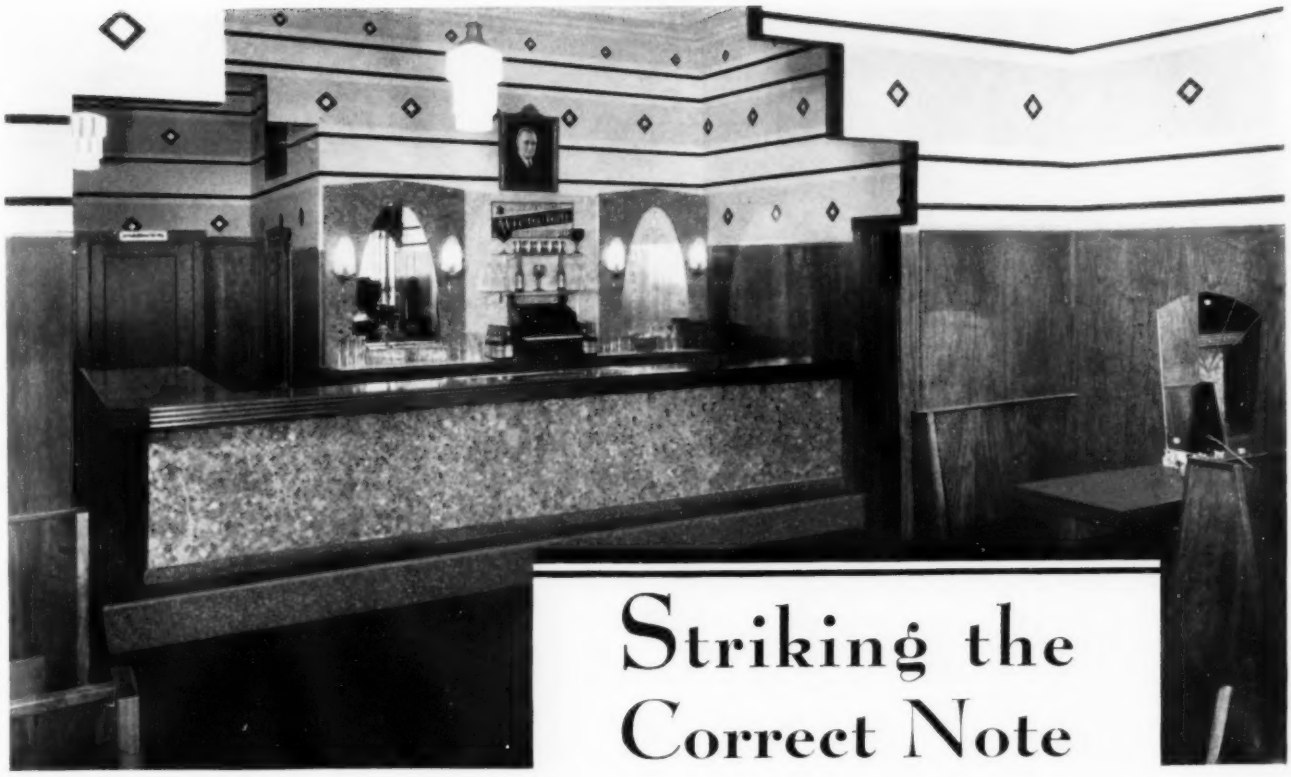
The prices in this tabulation enable one to visualize at a glance the main trend of the material market. Their significance does not extend beyond that point, and the explanation below should be read carefully.

F. W. Dodge Corporation Composite Prices as Indicated in Explanation—

Material	This Month	Month Ago	Year Ago
Portland Cement	$2.10	$2.10	$2.00
Common Brick	11.85	11.75	11.80
Structural Steel	1.60	1.60	1.60
Lumber	15.65	15.60	15.60

Prices given in this comparison are composite and do not in all cases refer to one item. For instance, the price of structural steel is the composite of prices of shapes and plates f.o.b. Pittsburgh; the price of lumber is a composite of five items of Southern pine and five items of Douglas fir f.o.b. mill; the price of cement is a composite of prices in fourteen different cities per barrel, carload lots, to contractors; price of brick is composite in fourteen cities per M, delivered on the job.

*As previously published in *General Building Contractor.*



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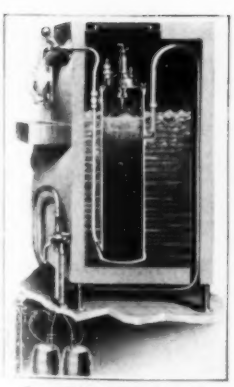
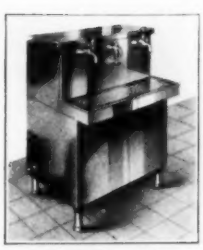
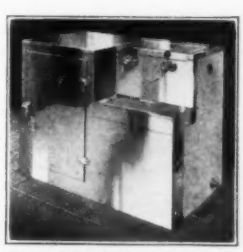


Liquid-Zahm Controlled Pressure Beer Drawing System



Red Diamond Beer Coolers for 2, 3 or 4 Coils or Liquid-Zahm System

Red Diamond Service Bar Styles in Wood (as shown) or Stainless Steel. Coils, Direct Draw, or Liquid-Zahm System



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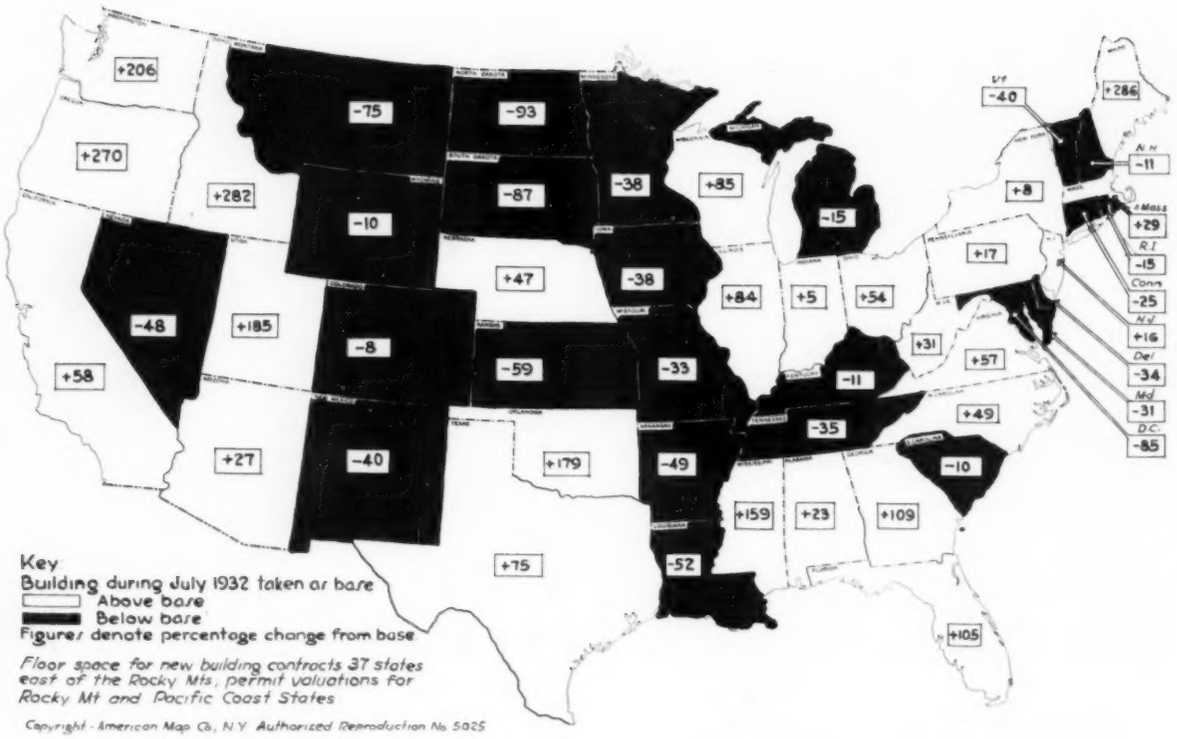
New Orleans Detroit Buffalo Cleveland Cincinnati Nashville
Memphis St. Louis Minneapolis Kansas City Dallas
Denver Salt Lake City Seattle San Francisco Los Angeles



BUILDING TRENDS AND OUTLOOK

By L. SETH SCHNITMAN, Chief Statistician, F. W. Dodge Corporation

Privately-financed construction contracts during August, as based upon data for the initial three weeks of the month, were larger in volume than were recorded during August, 1932, continuing the improvement over 1932 first manifested in May.

Of large importance, too, is the fact that publicly-financed work during August was materially larger than the total shown for July and, when complete records are available, may likely exceed the January total which was the largest monthly volume for 1933.

This is of considerable significance since it is the first manifestation of the results of the federal public works program upon which so much importance now rests, if the current recovery movement in business and industry is to be maintained. Publicly-financed construction contracts let during August, however, failed to attain the level of August, 1932, but it now appears probable that either in September or October the volume of this class of awards will materially exceed thenceforth the respective monthly totals of 1932.

Contracts for construction of all types awarded in the 37 eastern States during July totaled $82,693,100 as contrasted with the revised figure of $102,341,900 for June and $128,768,700 for July, 1932. Residential building in July showed a gain of 20 per cent over a year ago but was seasonably smaller than in June. Of the 13 large economic areas into which the 37 States have been grouped, 11 showed larger residential contract totals than were reported in July, 1932; the only exceptions occurred in the Central Northwest (Minnesota, the Dakotas, Northern Michigan and Northwest Wisconsin) and the New Orleans territory (Mississippi and Louisiana). On the basis of returns for the first three weeks of August it appears that the almost universal improvement in residential building as compared with 1932 was practically sustained throughout those same areas.

It should be remembered that under the operations of the National Industrial Recovery Act, slum-clearance and low-cost housing projects are to be stimulated with government funds by loans to deserving projects. Modernization work along broad lines will probably also be undertaken with governmental aid, which will likely embrace not only residential properties but even commercial properties within the areas or communities where such modernization appears desirable. Already five low-cost housing and slum-clearance projects have received the tentative approval of the Federal Emergency Public Works Administration for loans: in Brooklyn, N. Y.; East Boston, Mass.; Philadelphia; Queens Borough, New York; Hutchinson, Kansas. Contracts for these projects will likely be awarded before September 15, while similar projects will be approved for Federal loans as soon as necessary investigations can be made.

All of this will serve to swell the totals for residential building contracts and to provide a favorable showing in contrast with the figures for 1932. It therefore appears reasonably safe to forecast a volume of residential contracts for the final quarter of 1933 in excess of that for the corresponding period of 1932 by as much as 25 per cent.

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MATERIAL PRICES, BUILDING WAGE RATES AND BUILDING COSTS COMPARED

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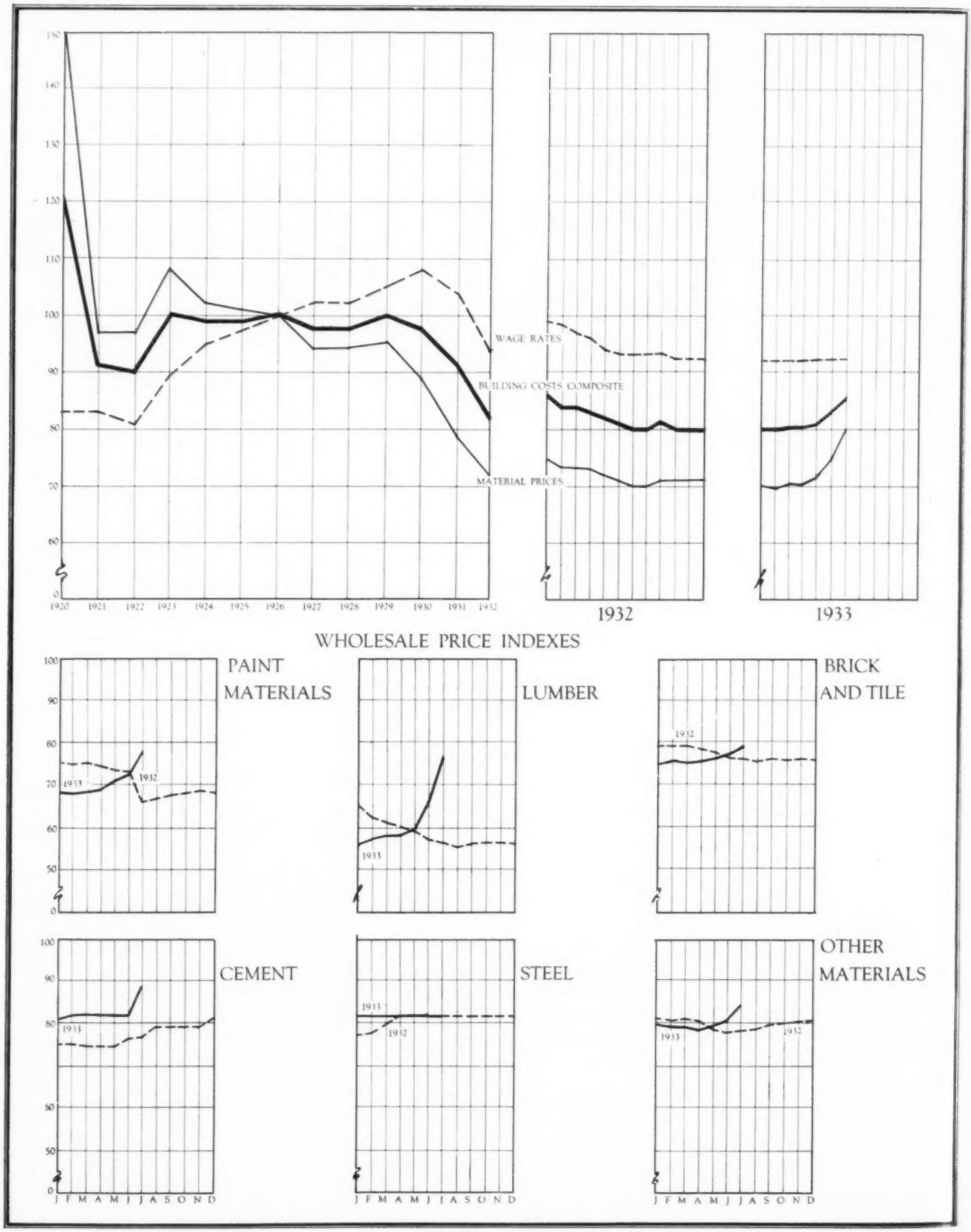

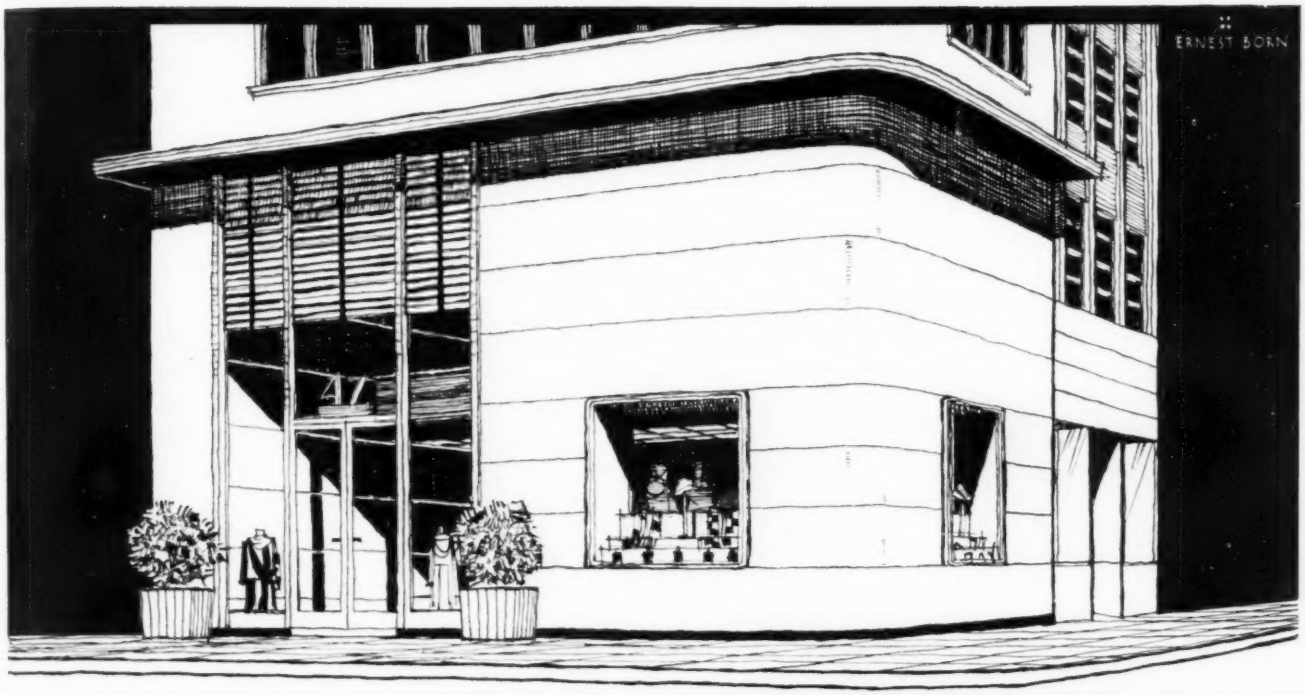

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WAGE SCALES IN THE BUILDING TRADES

Information Furnished by National Association of Builders Exchanges and Compiled by Division of Statistics and Research, F. W. Dodge Corporation, as of August 15, 1933

	Asbestos Workers	Bricklayers	Bricklayers' Tenders	Carpenters	Cement Finishers	Electricians	Hoisting Engineers	Iron Workers—Ornamental	Iron Workers—Structural	Laborers	Lathers	Painters	Plasterers	Plasterers' Tenders	Plumbers	Roofers—Composition	Roofers—Slate & Tile	Sheet Metal Workers	Steamfitters	Stone Masons	Tile Setters	Tile Setters' Helpers
Akron	$1.00	$1.25	$0.45	$0.70	$0.70	$0.75	$0.70	$0.60	$0.60	$0.40	*$0.87½	$0.65	*$1.00	$0.62½	$0.85	$0.80	$0.80	$0.80	$0.85	*$1.25	*$1.25	*$0.50
Atlanta	1.00	1.25 1.40	‡.30 .45	.70	1.25	.90 1.10	.60 1.00	.35 1.85	1.25	.25 35	1.00 1.25	.75	1.25	.30 .45	1.25	.80	.80	.90 1.00	1.25	1.00 1.25	1.25	.40
Baltimore	1.00	*1.00	1.00	.65	*1.00	*1.00	*1.25	*1.37½	*1.37½	.20 .30	*1.25	.80 *.90	*1.25	1.00	*1.00	.75	.75	*1.12½	*1.00	1.00	1.25	.72
Boston	1.25	*1.30	.70	*1.17½	1.17½	*1.25	1.17½	*1.20	*1.20	.70	*1.25	*1.12½	*1.37½	*.95	*1.25	*1.17½	*1.05	1.17½	*1.25	*1.30	*1.30	*.95
Buffalo	1.00	*1.12½		*1.00	1.00	*1.00	1.00	1.12½	1.12½	30 .5[illegible]	1.00	*1.00	1.00		1.00	.60	1.00	1.00	*1.00	*1.12½	*1.18¾	†.60
Chicago	1.37½	*1.37½		*1.31¼	1.31¼		1.31¼			.82½	*1.37½		*1.37½		1.37½	1.37½	1.40	1.37½	1.37½	1.37¼	1.37½	1.00
Cincinnati*	1.15	1.25	.70	1.20	1.02½	1.25	.80 1.25	1.25	1.25	.45	1.31¼	1.15	1.37½	.70	1.25	.92½	1.07½	1.07½	1.12½	1.00	1.00	.50
Cleveland*	.80 1.17½	1.25		.90 1.12½	.90 1.12½	1.00 1.37½	1.12½	1.00 1.25	1.00 1.25	.57½ 72	1.25	.80 1.12½	1.25		1.25	66 1.15	1.00 1.37½	90 1.12½	.90 1.25		.80 1.25	
Columbus	1.00	1.30	.62½	.80	.80	1.00	1.15	1.25	1.25	.40	1.00	.80	1.00	.62½	1 00	.80	1.00	.80	1.00	.75	1.25	.50
Dallas††	10.50	10.00	.50	8.00	10.00	*11.00	10.00	10.00	10.00	.35	10.00	*9.00	*10.00	*.50	12.00	8.00	9.00	*10.00	12.00	10.00	*12.00	†*.75
Dayton*	1.25	1.30	.80	1.00	1.15	1.35	1.25	1.35	1.35	.35	1.10	1.00	1.25	.80	1.15½	.85	1.00	1.00	1.15½	1.30	1.50	.60
Denver††	9.00	12.00 *13.00	6.50 7.00	10.00	10.00 11.00	10.00 11.00	10.00	10.00 11.00	10.00 11.00	4.00 5.00	11.00	*10.00	12.00	7.00	11.00	7.00 8.00	7.00 8.00	9.00	9.50	12.00 13.00	10.50	† 62½
Des Moines	1.00	1.25	.65	1.00	1.00	1.00	1.00	1.00	1.00	.55	1.00	1.00	1.25	.75	1.25	1.12½	1.12½	1.12½	1.25	1.50	1.25	.80
Detroit	1.37½	1.25 max.	.55 .60	.80 1.00	.70 .90	1.25 1.40	.60 1.00	1.00 1.20	1.00 1.25	.50 .55	1.37½	.80 1.00	1.00 1.25	.70 .80	1.00 1.50	.70 .90	.80 1.00	.80 1.00	1.25 1.50	1.25 1.50	1 00 1.25	.80
Duluth	1 00	1.00	.50	.80	.80	1.00	.80		1.00	.50	.80	.80	1.00	.70	1.00	70	1.00	.85	1.00	1 00	1.00	1.00
Erie		1.00	45 .50	.80	.80	.90 *1.00	.90	.60 .80	.90	.35	.90	.60 .70	1.00	.40 .50	1.00	.50 60	.80 90	†.80 .90	*1.00	1 00	.80	.40 .50
Grand Rapids	.65 .80	1.25	.40	.60	.65	.90	.75	.80	1 00	.35	.80	.60	.80	.40	.90	.50	.70	.70	.90	1.25	1.25	.50
Houston	1 00	1.00		1.00	1.00	.95	1.00			50	1.00	.62½	1.00		.75	60	1.00	1.00	1.00	1.00	1 00	
Indianapolis	1.32½	1.62½	.90	1.22½	1.17½	1.50	1.37½	1.45	1.45	.40 .45	1.37½	1.25	1.57½	1.00	1.00	.60 .90	1.27½	1.22½	1.50	1.62½	1.50	.60
Kansas City	.90	1.32½	.80	1.00	1.00	1.00	1.00	1.00	1.00	.60	1.00	1.00	1.06¼	.80	1.00	.92½	.92½	1.00	1.00	1.12½	1.25	.62½
Los Angeles††	10.00	8.00	6.00	7.00	8.00	7.00	8.00	9.00	10.00	4.00	10.00	7.00	9.00	6.00	9.00	7.00	7.00	8.00	10.00	8.00	6.00	† 75
Louisville	1.12½	1.00	.50	.80	1.00	1.00	1.00	1.00	1.00	.25 .35	1.12½	.90	1.00	.50	1.12½	.30 .50	.85	.85	1.12½	1.25	1.00	.50
Memphis	1.00	1.37½	.50	.50	.50	1.00	.75	.75	.75	.20	1.00	.75	1.25	.50	1.25	.25 .40	1.12½	1.12½	*1.25	1.37½	1.25	.50
Milwaukee	1.00	1.00	.75	.92½	1.00	1.25	1.00	1.05	1.05	.60	1.00	1.00	1.00	.75	1.00	1.00	1.00	.92½	1.00	1.00	1.00	.75
Minneapolis	1.00	1.00		.80	80	1.00	.80	.90	1.00	.45	.75 .85	.80	1.00	.70	1.00	.70	.70	.80	1.00	1.10	1.00	.65
Nashville	1.00	1.00		.65		1.00				.30	1.00	.80	1.00	.30	1.00	.65	65	.65	1.00	.90	1 25	
New Haven*		1.20	.50 .60	.80 1.06¼	1.20	.80 1.00	1.16¾ 1.27½	1.37½	1.37½	.45 .50	1.27½	.80 1.00	1.20	.50 .60	1.06¼	.65	1 50	1.06¼	1.06¼	1.20	1.20	
New Orleans	.65 .80	1.25	.85	.55 .75	1.00	1.25	1.25	1.25	1.25	.35 .50	1.25	.75 .90	1.25	.75	1.00 1.25	.40	.90 1.15	.90	1 05 1.25	1.50	1.25	.35
New York City††	11.20	13.20	8.00	11.20	c11.20	11.20	13.20	11.20	13.20	6.60	11.20	11.20	12.00	8.50	c12.00	10.28	12.62	11.20	11.20	13.20	11.50	8.50
Oakland††	6.40	9.00	5 60	7.20	7.20	8.00	9.00	7.20	9.60	5.00	8.00	7.00	8.80	6.00	8.00	6.40	6.40	7.50	9.00	9.00	8.00	5.00
Oklahoma City††	8.00	8.00	4.00	6.00 8.00	8.00	6.00 8.00	8.00	8.00	8.00	3.50	.80	7.00 8.00	.80	4.00	.80	6.00	6.00	8.00			11.00	†.62½
Omaha	1.32	1.00	.45	.80	.90	1.00	1.00	.90	.90	.35	1.00	.80	1.00	.45	1.00	.72½	.87½	.87½	1.00	.90	1.00	.50 .60
Philadelphia	1.00	1.50		1.00	1.05	1.25	1.18½	1.00 1.37½	1.00 1.37½	35 .40	1.37½	.62½	*1.37½		1.04	1.00	1.25	1.25	1.04	1.25	1.25	
Pittsburgh	*1.50	*1.50		*1.25		*1.56¼	1.37½ 1.43¾	*1.37½	1.37½	70	*1.50	*1.18¾	*1.50		1.50	*1.25	*1.50	*1.31¼	*1.50	*1.40	1.33¾	.88
Portland, Ore.††	8.00	*9.60	7.20	7.20	*7.20	*8.00	6.40 9.60	8.80	8.80	7.20	*8.80	7.04	*9.60	*7.20	*8.80	7.20	7.20	*8.00	*8.80	*9.60	8.00	6.40
Reading	.70 .80	.90	.75	.75	.85	.75				.35	.75	.70	.85	.75	.90		.80	.80	.90	.75	.90	.50
Richmond	60 .65	1.25		.40 .60	.35 .50	.80		.20 .70	.70	.20	1.00	60	.60		1.00	.25 .60	.25 60	1.00	.90	.75	1.25	
Rochester	.91	1 12½	.55	*.90	*1.12½	*1.15½	1.00	.70-*1.00	.70-1.00	.55	.90	*.90	*1.12½	.55	*1.06¾	*.80	*.80	.90	*1.06¾	*1.12½	1.12½	47½
Salt Lake††	6.50 7.20	2.00	.62½	.90	1.00	1.00	1.00	1.00	1.00	4.00	8.00	7.00	1.25	.80¼	1.00	.90	1.00	1.00	1.00	1.12½	8.00	4.00
San Antonio††	6.00 10.00	6.00 10.00	2.00 3.00	2.00 7.00	3.00 8.00	3.00 7.00	4.00 7.00	1.75 4.50	5.00 10.00	1.50 2.50	4.00 7.00	3.00 7.00	4.00 8.00	2.00 3.00	5.00 8.00	5.00 6.00	4.00 6.00	3.00 7.00	5.00 8.00	3.50 8.00	4.00 10.00	2.00 3.00
San Francisco	6.40	9.00	7.00	7.20	7.20	9.00	9.00		9.60	5.00	8.00	7.00	8.80	7.50	8.00	8.00	8.00	7.20	8.00		8.00	5.00
Seattle††	8.00	9.60	5.28	7.20	7.20	*8.80	8.00	8.00	8.80	4.75	*8.80	*4.50	*9.60	*6.40	*8.80	7.20	7.20	8.00	*8.80	9.60	8.00	
Sioux City	.90	1.00		.75	.75	1.00		1.00	1.00	.35	.90	.60 .90	1.00		1.00	.60 1.00	.60 1 00	.90		1 25	.60 1.00	
St. Louis	1.25	1.25	1.00	1.25	1.31¼	1.50	1.35- 1.47	1.47	1.47	.87½	1.25	1.25	1.50	1.06¼	1.43¾	1.17½	1.25	1.25	1.43¾	1.25	1 25	.76½
St. Paul	1.18	1.10		.75 .85	.75 .85	.90	.80	.90	.90	.45	.75 .85	.80	1.10	.70	.95	.70	.70	.80	.95	1.10	1.25	
Washington, D.C.	*1.50	1.75	.50 .75	*1.37½	1.25	*1.65	*1.37½	*1.65	*1.65	.75	*1.62½	*1.37	*1.75	*.75	*1.50	*1.37½	*1.37½	*1.50	*1.50	*1.25	*1.50	.75
Wichita	.60	.75 1.25	.25 .40	.40 .75	.40 1.00	.50 .87½	.30 .75	.40 1.00	.40 1.00	.20 .40	.50 1.25	.50 .87½	.60 1.25	.25 .50	1.00	50 1.00	.50 1 00	.50 1.00	75 1 12½	.75 1 25	.50 1.00	.25 .40
Youngstown††	*1.37½	12.00	6.80	10.00	9.00	11.00	10.00	12.00	12.00		12.00	10.00	12.00	6.80	11 00	10.20		10.00			10.00	.70

NOTE.—Where two figures are shown they are the minimum and maximum. All figures are for hour rates except as indicated. ††8-hour day. †Rate per hour. *On 5-day week basis. ‡Correction. Asterisk after city indicates all trades on five-day week basis.

ABOVE DATA ARE WAGE SCALES AND DO NOT NECESSARILY INDICATE ACTUAL WAGE RATES BEING PAID IN THE RESPECTIVE TRADES.

Scovill helps you keep pace with the

Building Boom

THIS fall tens of millions of building-dollars are going to work . . . in new operations, and in modernization of old office buildings, apartment houses and residences. It is the long-awaited opportunity for architects who are ready to serve the new era.

Being "ready" includes a full knowledge of modern improvements. Details are immensely important. Scovill Flush Valves, for example, will definitely help you in selling your plans. They are of special value to the architect because they are the only self-lubricating flush valves on the market today. Their smoother action and longer life are features which will help you build a reputation for thoroughness.

In addition, you install many other advantages when you recommend Scovill Flush Valves. . . . A self-cleaning by-pass that automatically prevents clogging. Balanced-piston construction that cuts out water-hammer. The flush, too, can be regulated from the outside without shutting-off the water. And, given sufficient volume, positive operation under low water pressures is assured.

Through the exactness of Scovill standards your client enjoys service, satisfaction, and long-term savings . . . which he is quick to credit to your counsel. You will find the Scovill Flush Valve a good detail to stress when talking to your client. Send for the handy catalog giving full information. It is yours for the asking.

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Scovill Flush Valves—Shower, Bath and Lavatory Equipment—Tubular and Miscellaneous Plumbers' Brass Goods

SCOVILL

MANUFACTURERS' ANNOUNCEMENTS

Architects are invited to use the coupon on this page as a convenient means of obtaining manufacturers' publications describing in detail the products and materials mentioned.

901
IMPROVED MOTOR WHEEL WATER HEATERS

Improvements lately made in the Motor Wheel Automatic Oil Burning Water Heaters have greatly simplified installation and operation. The principal added feature is a mechanical snap-action control, eliminating the necessity for electric current. Snap-action of the thermostat is actuated by a vacuum-type bellows. A drop in temperature of the water in the boiler of the heater causes a vapor contained in the bellows assembly to liquefy, exerting a vacuum pull on the bellows and causing the snap-switch to operate. A rise in temperature causes the reverse action to occur. The water temperature may be regulated by means of an adjustment on the thermostat. Two sizes of the water heaters are available for domestic use, rated at 25 and 50 gallons per hour respectively.

902
NON-STRUCTURAL INSULATION ADDED TO CELOTEX LINE

To meet the need in certain types of construction for a non-structural insulating material, The Celotex Company announces Celotex Rock Wool Batt offering high efficiency protection where strength is not required. It is made wall-thick and has, according to its manufacturers, a remarkably low conductivity per inch of thickness, furnishing the maximum protection practical within the confines of the standard wall section. The Batt consists of pure rock wool properly felted into a wall-thick batt, 15 inches by 18 inches in size, that fits snugly between studs, joists and rafters. Light in weight — two and one-half pounds per batt — it eliminates the hazard of excessive loads between framing. The Batt is felted to a thickness that leaves a small air space between it and the interior wall to avoid interference with the formation of plaster keys when open lath is used. Because of its uniform texture and its springy self-sustaining nature, it is claimed that this new product cannot settle and sag between studs.

903
STABILIZED STAINLESS STEELS

Subsidiary companies of the United States Steel Corporation announce the development of a method of stabilization of 18-8 (18% chromium, 8% nickel) stainless steels with titanium addition. A distinctive contribution to the art of metallurgy is involved in this development which effectively removes the hazard of intergranular corrosion, a phenomenon which has heretofore been a serious factor in installations where heat treatment is impracticable after welding and in cases where these steels are used in applications involving high temperatures. This improved product will be marketed as USS Stabilized 18-8 and is now available in all stainless steel products manufactured by subsidiary companies of the Corporation.

904
ARMSTRONG FLOORS

Linotile, Accotile and Armstrong's Rubber Tile are described in a group of three new booklets offered by the Armstrong Cork Company. The physical composition and adaptability of each of the three products, together with many color samples and illustrations of actual applications, make these three publications an interesting source of suggestion for decorative treatment of large and small rooms both of public buildings and private residences.

To Obtain Further Information

about any products mentioned, indicate the number or name of product and send to THE ARCHITECTURAL RECORD, 119 West 40th Street, New York, N. Y.

.....

.....

Name _____

Position _____

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City and State _____

PENNVERNON WINDOW GLASS INVITES COMPARISONS!

Compare it with other glasses for TRANSPARENCY . . .

PENNVERNON *excels!*

THIS is our claim: that Pennvernon Window Glass has the highest degree of transparency yet attained in sheet glass making . . . and that, as a result, objects can be seen more clearly and in truer colors through Pennvernon. But we do not ask you to believe our bare claim. We invite you to prove its truth for yourself by making some actual comparisons.

Hold up a sample of Pennvernon and a sample of any other glass side by side . . . and compare them for transparency by looking through them. Still better, look through a real window glazed with Pennvernon . . . then through a window glazed with any other glass. Your eyes will not deceive you . . . and you will be convinced that in transparency . . . Pennvernon excels.

Besides being more transparent, Pennvernon is more brilliant of finish, longer-lasting, and the only sheet glass which stays permanently white. All these qualities are the direct results of the special manufacturing process and the unusually pure ingredients used in making Pennvernon.

Compare Pennvernon with other window glasses by making actual tests such as those suggested here. Then you will know that to specify Pennvernon is to specify the best. Pennvernon is available in single and double strength, and in thicknesses of $\frac{3}{16}$" and $\frac{7}{32}$", at the warehouses of the Pittsburgh Plate Glass Company in all principal cities, and through leading glass jobbers and sash and door manufacturers. Write for samples. Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pa.

Specify PENNVERNON WINDOW GLASS

MAKE EVERY MEMBER COUNT!

. . . USE LATH THAT ADDS STRENGTH *to* FRAMEWORK

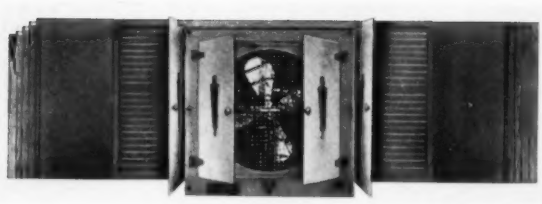
Pittsburgh Steeltex

● When Ribbed Pittsburgh Steeltex Lath is nailed to the wall studs and ceiling joists, the sturdy network of welded steel wires, ribs and fibre backing strengthens the whole framework of the building. The plaster slab, thus materially relieved from strains, resists the tendency to crack. Pittsburgh Steeltex is more than a base for plaster. It is a structural member, actively contributing to the support of the framework. For more complete information about Steeltex, fill out and send us the coupon below.

PITTSBURGH STEEL COMPANY
Union Trust Building • Pittsburgh, Penna.

Pittsburgh (NATIONAL) Reinforcing for Concrete
BUILD FOR PERMANENCE
OUR CATALOGUE IS FILED IN SWEET'S

Pittsburgh Steel Company, Pittsburgh, Pa. A-1
Gentlemen: Please send me: ☐ Information ☐ Prices on Pittsburgh Steeltex: ☐ Interior Lath ☐ Exterior Stucco Base ☐ Partitions ☐ Floor Lath ☐ Have your representative call
Name.....
Address.....



905

HEALTH WINDOW

This air conditioning device fits standard-sized casement or double-hung windows. Manufacturer names nine operations performed: Draws in outside air; filters and purifies; humidifies; dehumidifies; heats and circulates the air; distributes disinfectant when desired; eliminates outside noise, and can be used to exhaust air from a room. Initial cost and maintenance are low. The Health Window is a product of The Burrowes Corporation of Portland, Maine. Descriptive material is available on request.

906

NEW SILENTAIRE CASEMENT WINDOW BY TRUSCON STEEL COMPANY

The Truscon Steel Company announces an improved model of its Silentaire Window, casement type, the new model being designated as Series 5. It retains such features of the standard Silentaire casement as muffling of street noises, provision for ample natural ventilation and freedom from drafts. The new series is a complete, shop-fabricated unit costing but little more than the standard casement window with hopper vent. Erection is equally simple and there are no maintenance or operating costs. The combination of the outside deflector and the inside reflector at the base of the Series 5 casement prevents rain or snow from entering and such rain or snow that may strike the ventilator is carried away through outlets in the sill section.

907

NEW WELDING DIVISION OF PITTSBURGH TESTING LABORATORY

Principal services of the new National Weld Testing Bureau of Pittsburgh Testing Laboratory include reports on welding processes and on weld specimens, prior to and during construction. These reports, constituting a new service for manufacturers, fabricators, contractors and other firms, are based on the requirements for weld testing as embodied in numerous Specifications, Codes and Rules. Inspection of welded products and structures, laboratory tests of weld specimens, and investigation of special welding problems also form a part of the service of the Welding Bureau. It will operate on a national scale, employing the expert personnel and broad facilities of Pittsburgh Testing Laboratory. James W. Owens, internationally known engineer in the welding field, has been appointed Director of the new Welding Bureau.

BRIXMENT IS . . . WATER-PROOFED

BRIXMENT furnishes as great protection against leaky brick walls as can be had from any kind or type of mortar material.

It is permanently water-proofed by the addition, during manufacture, of calcium stearate—the most effective water-proofing agent known.

Leakage through Brixment mortar itself is impossible. More important still, the calcium stearate gives the mortar *a high water-retaining capacity.* This keeps the brick from sucking the moisture out of the mortar too fast, and helps prevent shrinkage cracks *between* the brick and the mortar.

Further protection is furnished by the extreme plasticity of Brixment, which allows a more thorough bedding of the brick, and insures a greater area of bond between the brick and the mortar.

LOUISVILLE CEMENT COMPANY, *Incorporated*, LOUISVILLE, KY.

District Sales Offices: 228 N. La Salle St., *Chicago;* 600 Murphy Bldg., *Detroit;* 101 Park Ave., *New York* .... Mills: Brixment, N. Y. and Speed, Ind.

BRIXMENT

A Cement for Masonry and Stucco

Dependability

Under the slogan of "modernization" building owners are refusing to let their properties slip backward. Where installation of new hardware is required they realize that specialties under the Rixson trade mark are most dependable for all their purposes—economy, modern convenience—and efficiency.

THE OSCAR C. RIXSON COMPANY
4450 Carroll Avenue, Chicago, Ill.
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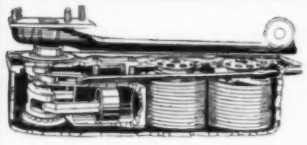
RIXSON

Hardware Specialties

• • •



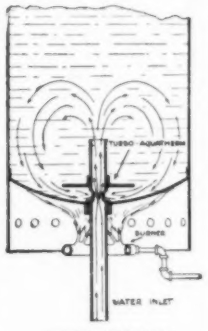
No. 30 and 40 Double Acting Floor Check
The big mogul door control that conquers the excessive drafts of tall buildings and fills every heavy duty requirement.

Keep Up To The Minute with the NEW

DAHLQUIST TURBO
COPPER

Water Heater

Your trade is always on the alert for the very latest equipment in copper boilers. You can offer them the best if you sell Dahlquist copper range boilers and hot water storage systems equipped with the TURBO. It guarantees a continuous supply of fresh, clean, sediment-free hot water at all times.



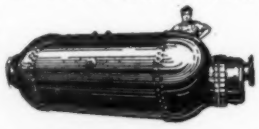
THE TURBO
A new Dahlquist patent which prevents mud from accumulating in the boiler and does away with costly burnouts.
SAVES GAS

Super Aquatherm Gas Underfire

It is Theodore W. Dahlquist's latest invention and is placed in all his boilers preventing mud from accumulating.

Dahlquist boilers equipped with the patented Turbo cost no more, uses 50% less gas, prevents costly burnouts and keeps hot water really clean.

Write for full particulars
Architects and heating engineers may rely entirely on Dahlquist workmanship and experience, whether for range boilers, automatic storage boilers or heavy pressure boilers.



DAHLQUIST MFG. COMPANY
70 WEST 3RD STREET SO. BOSTON, MASS.

908
COLOR RELATIONS AMONG THE WHITE METALS

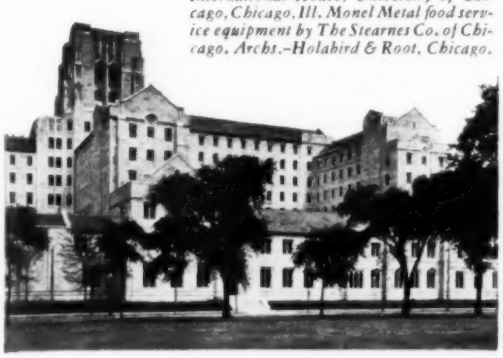
The copper-nickel and copper-nickel-zinc alloys, usually considered in the single group of "white metals," actually give a rather wide variation in color. This problem becomes an important one when it is desired in architectural construction to use cast, wrought, and extruded parts in conjunction with one another. Ordinarily each method of manufacture requires its own individual compositions. Judicious choice of compositions must therefore be made in order to attain a pleasing harmony of color. The Research Laboratory of the International Nickel Company has found that some of the metals are distinctly bluish, others tinted yellow, others pink, and some are grayish. These colors are purely relative, and the differences in color are not perceptible in many cases until the metals are placed in juxtaposition.

909
NEW WEBCO SWINGING LEAF BLACKBOARD

A blackboard for classroom use employing the swinging leaf principle is announced by the Weber Costello Company of Chicago Heights, Illinois. Four leaves (3 x 3½ feet) of double-surfaced Hyloplate blackboard provide a writing surface of 84 square feet—equal to the usual blackboard area in the average-sized classroom. The new product is light in weight, requiring no special wall construction or strengthening of floors. It is attached to the wall by two brackets, connected by a rod on which the leaves pivot. Leaves have metal bound edges and are individually removable. Cork bulletin boards can be interleaved with blackboard. Economy of wall space, versatility in use and aid to visual and mental concentration are the worthy advantages of this product.

910
UNIT PANEL SYSTEM

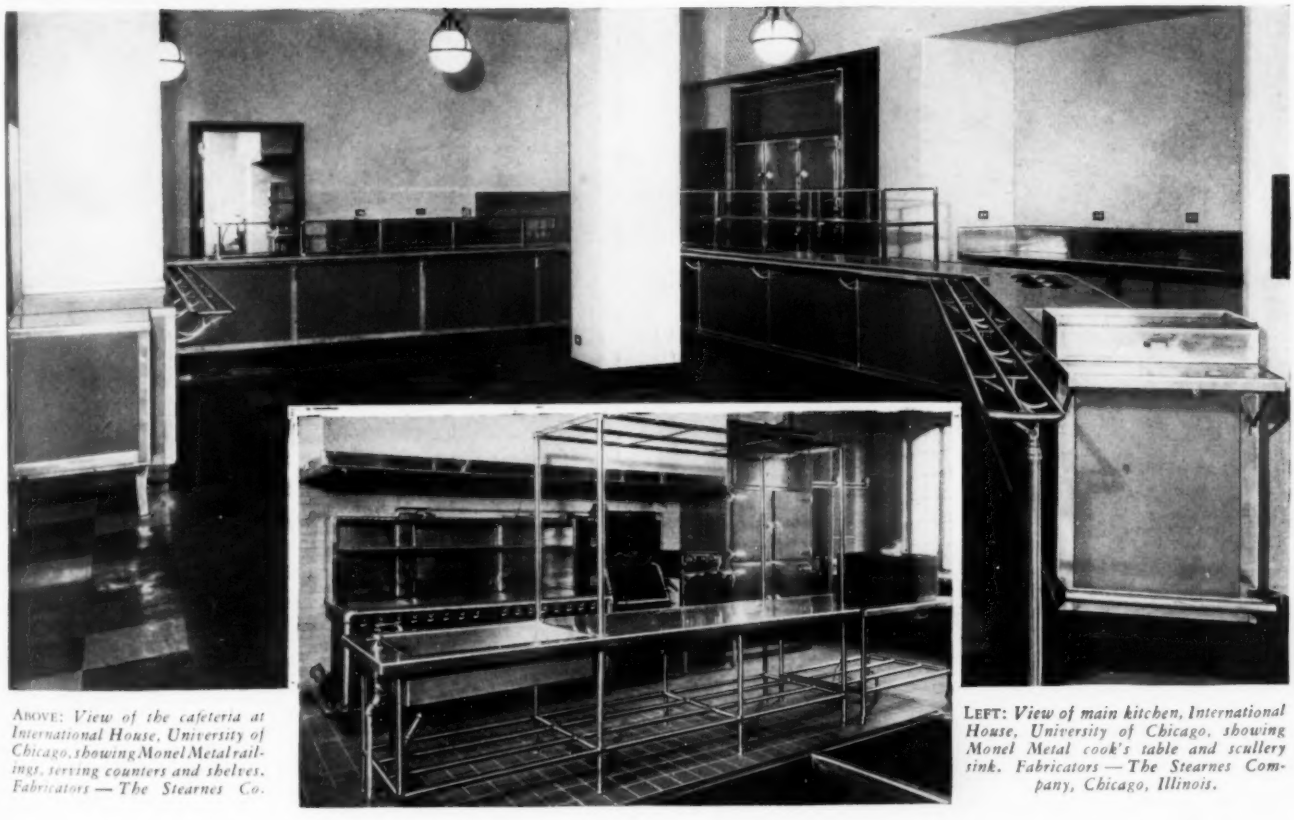
Separate bathroom panels, one for the lavatory and one for the bath, each complete not only with the logical accessories associated with these products, but with an integral chassis and plumbing casings, have been developed by the Bureau of Design Development of the American Radiator and Standard Sanitary Corporation. The virtue of the unit panel system is its flexibility. The units can be used separately regardless of the layout of the room, thereby making them adaptable for remodeling, modernizing, and for the replacement of iron pipe with copper or brass pipe. The piping and all other work can be done without disturbing the walls, the units being so designed that the plumbing work can be done under the floor, eliminating the necessity of breaking into the walls. Even the existing wall treatment can be retained, since the units provide the necessary water-resisting surfaces where water-resistance is demanded. As can be seen from the photograph of the con-



International House, University of Chicago, Chicago, Ill. Monel Metal food service equipment by The Stearnes Co. of Chicago. Archs.–Holabird & Root, Chicago.

Capes Photo, Chicago

WHERE MONEL METAL *INVITES THE WHOLE WORLD TO MEALS*



ABOVE: *View of the cafeteria at International House, University of Chicago, showing Monel Metal railings, serving counters and shelves. Fabricators — The Stearnes Co.*

LEFT: *View of main kitchen, International House, University of Chicago, showing Monel Metal cook's table and scullery sink. Fabricators — The Stearnes Company, Chicago, Illinois.*

IN THE UNIVERSITY OF CHICAGO'S NEW INTERNATIONAL HOUSE . . . . . THE STEARNES COMPANY INSTALLS MONEL METAL FOOD SERVICE EQUIPMENT

● Students from every foreign nation who come to the University of Chicago for advanced scholastic education are welcome to live at International House. There, they also receive an education in the most modern American mode of life. For in this new home for foreign students, Monel Metal kitchen and cafeteria equipment is used . . . an installation put in by The Stearnes Company.

Like International House itself, the lustrous, silvery kitchen and cafeteria equipment is intended to serve many generations of students. Monel Metal is practically everlasting...despite the hard knocks it is bound to buck. It has the strength of steel and, being solid metal right through, there is no coating to chip, crack or wear off.

Besides making repair or replacement a rare event, Monel Metal equipment helps to hold down operating costs. Absolutely rust proof and highly resistant to corrosion caused by food acids, cooking vapors, and cleaning materials, its glassy smooth surface develops no pits for dirt and food to hide in...all important factors in maintaining cleanliness easily at low cost.

No architect's file is complete without full data on Monel Metal Food Service and other equipment for institutions and homes. Just drop us a card and we shall be pleased to forward detailed information at once.

• • •

Monel Metal is a registered trademark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET, NEW YORK, N. Y.

In Modern Small Homes

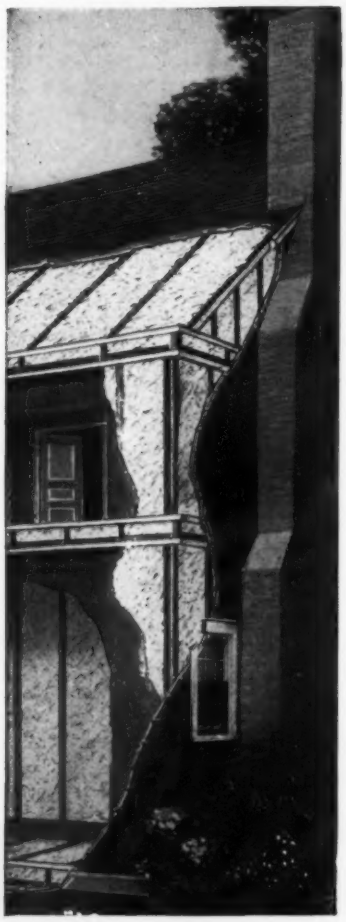
Caldwell Sash Balances have replaced ancient methods of balancing windows by sash weights—eliminating cords, pulleys and weights.

They permit the design of attractive narrow mullion windows and interesting groupings not practical with old style construction.

Send us your name for complete catalog of working drawings, installation instructions and data.

Caldwell Manufacturing Co.
56 Industrial St., Rochester, N.Y.

CALDWELL *Sash Balances*



INSULATE WITH U. S. MINERAL WOOL

No better protection from the elements can be supplied to a building than insulation.

U. S. Mineral Wool effects a constant saving in fuel as it protects and assures more comfortable draftless rooms winter and summer.

It is cold proof—heat proof—fire proof—sound proof and vermin proof.

No other insulating material offers a like protection.

Sample and folder on request, address nearest office.

U. S. MINERAL WOOL COMPANY
280 Madison Avenue, New York

Western Connection
Columbia Mineral Wool Co.
South Milwaukee, Wisc

pleted room, a complete and simple interlocking of these units to form an entire steel bathroom or, if desirable, one or two steel walls of a bathroom, is an easy and practical matter. It is to be noted that these units do not call for any change whatever in existing plumbing technique, parts or material.

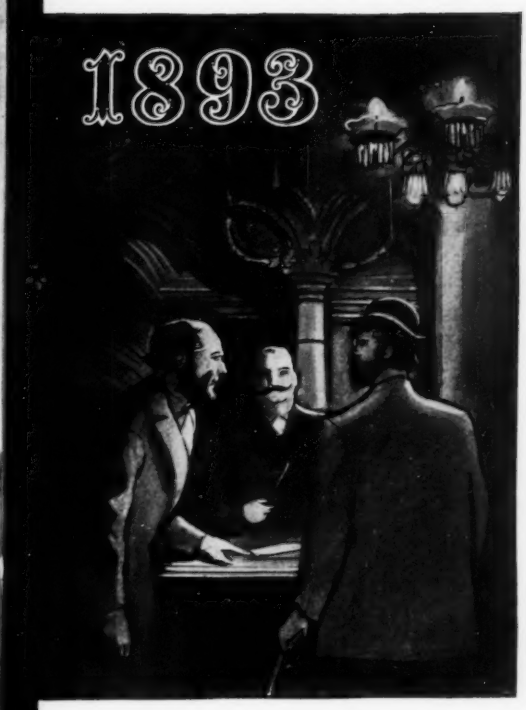
Other noteworthy features about the unit bathroom panels are: The units come in a standard height, yet they can be adapted to various ceiling heights. The patented water-seal around the bathtub is attractive and practical. All the steelwork is insulated for vibration and sound and can be favorably compared to non-metal walls. Panels are complete with medicine chest, lighting, a shelf for toilet articles, over-head equipment for towels and storage space for toilet paper and other bathroom accessories.

911

GREATER THICKNESS TO INSULATING LATH

A single thickness fiberboard Insulating Lath one and one-half inches thick is announced by the Armstrong Cork & Insulation Company of Lancaster, Pa. This new thickness is the latest addition to the line of Temlok insulation products. Temlok Insulating Board for use as sheathing, interior finish, and miscellaneous construction also will be furnished in the solid one and one-half inch thickness.

"In addition to providing more adequate insulation and thus assuring greater home comfort and lower fuel bills," says a statement from an Armstrong official, "the new thickness of Temlok guarantees an even better plaster base, offers further safeguards against plaster cracks, and entirely eliminates buckling and warping. Erection costs are practically the same as for thinner material."

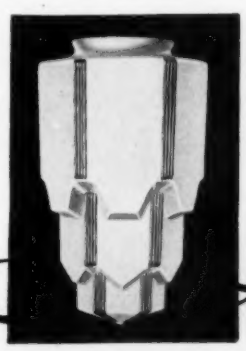


Years of Lighting Progress

The forty years that have elapsed since the last World's Fair have been productive of amazing growth and progress in science and industry. They have also brought about a parallel advancement in the field of illumination.

In 1893 the kerosene lamp was the principal illuminant in the American home. Macbeth "Pearl Glass" Lamp Chimneys then as now remain the best-known and most efficient chimney in America, perhaps in the world.

Through the years since '93, as the production and use of electric current increased, Macbeth technologists contributed newer and still newer forms of lighting globes for the efficient use and distribution of electric light . . . These contributions have reached their highest peak today in Macbeth "Monax" and Macbeth "Galax" Illuminating Globes . . . known for their efficiency and beauty as widely as Macbeth "Pearl Glass" Chimneys. Countless public and private structures, hotels, stores, restaurants and other buildings bear testimony to the efficiency and popularity of these modern Macbeth Illuminating Globes . . . MACBETH-EVANS GLASS COMPANY, Charleroi, Penna.



Macbeth Lighting Globes

EVANS
"Vanishing
Door"
WARDROBE

●

Class J

equipped with either "Floor" type (as illustrated) or "Jamb" type hinges. This is Class D wardrobe if made with flush doors.

CLASSROOM WARDROBES

High in Quality—Low in Cost

This type occupies a recess flush with the wall. Plaster back and ends. No partitions, but with mullions between pairs of doors. Wire mesh ceiling. Blackboards if required.

The "Vanishing Door" hinges on which the doors are hung are made with double pivoted arms and swing the doors back into the wardrobe entirely out of the way. Simple—trouble-proof—and last as long as the building.

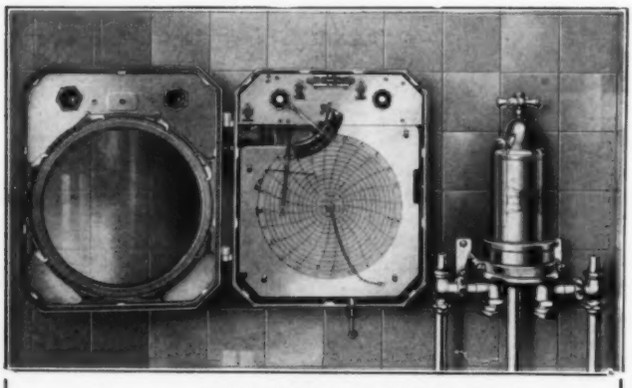
Wardrobes are furnished complete in the knockdown, with all woodwork cut to size, and only need to be nailed in place. The hinges are easier to put on than common butt hinges. The entire cost of installation is small.

We make many other types of school wardrobes, fully illustrated and described in 1933 Sweet's, Volume C, pages 774-781.

W. L. EVANS

WASHINGTON, INDIANA, U. S. A.

Continuous Flow Baths



Leonard HYDRIATRIC Suite

Reg. U. S. Pat. Off.

When you specify a Leonard Hydriatric Suite you have a choice of six designs in cases and twelve different combinations. Write for catalogue F which is Standard A. I. A. File size. In Sweet's Catalogues

Manufactured by

LEONARD-ROOKE CO.

INCORPORATED

Providence, Rhode Island

912

MURAL CANVAS

The above photograph shows artists at work on the murals for the new Metropolitan Life Insurance Building. The canvases shown are each of one piece. They were supplied by the Friedrichs Company in specified widths, finished and tinted to accommodate the individual artist's requirements. E. H. & A. C. Friedrichs are said to be the only domestic manufacturers able to fulfill specifications for single mural canvases of any dimension up to twenty-foot widths. The adaptability and durability of murals relate directly to the composition of the canvas and the treating processes to which it is subjected *before* reaching the artist. The architect who contemplates the use of murals will find much of interest in the booklet published by E. H. & A. C. Friedrichs Company, manufacturers of artists' canvas.

TRADE ANNOUNCEMENTS

READING IRON COMPANY

The Reading Iron Company, Philadelphia, announces the appointment of William Craig Wolfe as Vice President in Charge of Sales. Former connections include Commercial Steel and Iron Company, Seneca Iron & Steel Company, Standard Steel Tube Co., Highland Iron & Steel Company. In 1928 he was made General Manager of the last named Company, serving in that capacity until his recent appointment with Reading. Mr. Wolfe was a moving factor in the organization of the Wrought Iron Manufacturers' Association.

MILCOR STEEL COMPANY

Announcement is made by Mr. Louis Kuehn, President of the Milcor Steel Company, of the appointment of Mr. Thomas O'Neil as manager of the New York office effective August 1, 1933. Mr. O'Neil in 1931 was instrumental in introducing the Milcor line of Fireproof Building Materials including metal lath of all types, expansion corner beads and a variety of other expansion products and accessories.